FCC Test Report

Product Name	Portable Printer
Model No.	CV80
FCC	QISCV80

Applicant	Huawei Technologies Co., Ltd.
Address	Administration Building, Headquarters of Huawei Technologies Co., Ltd.,
	Bantian, Longgang District, Shenzhen, China

Date of Receipt	Sep. 11, 2018
Issued Date	Oct. 15, 2018
Report No.	1890137R-RFUSP01V00
Report Version	V1.0



The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration report of the equipment and evaluated measurement uncertainty herein.

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Test Report

Issued Date: Oct. 15, 2018 Report No.: 1890137R-RFUSP01V00



Product Name	Portable Printer		
Applicant	Huawei Technologies Co., Ltd.		
Address	Administration Building, Headquarters of Huawei Technologies Co., Ltd.,		
	Bantian, Longgang District, Shenzhen, China		
Manufacturer	Huawei Technologies Co., Ltd.		
Model No.	CV80		
FCC.	QISCV80		
EUT Rated Voltage	DC 7.4V by Battery		
EUT Test Voltage	AC 120V / 60Hz ;DC 7.4V by Battery		
Trade Name	HUAWEI / honor		
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C: 2017		
	ANSI C63.4: 2014, ANSI C63.10: 2013		
Test Result	Complied		

Documented By :

Vite Wang

(Adm. Assistant / Vita Wang)

Tested By

:

Sam Hsu

(Engineer / Sam Hsu)

Approved By :

(Director / Vincent Lin)



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1. GENERAL INFORMATION

1.1. EUT Description

Product Name	Portable Printer	
Trade Name	HUAWEI / honor	
Model No.	CV80	
FCC.	QISCV80	
Frequency Range	2402-2480MHz	
Channel Number	79	
Type of Modulation	FHSS: GFSK(1Mbps) /π/4DQPSK(2Mbps) / 8DPSK(3Mbps)	
Antenna Type	Chip Antenna	
Channel Control	Auto	
Antenna Gain	Refer to the table "Antenna List"	
USB Cable	Non-Shielded, 0.32m	

Antenna List

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	HUAWEI / honor	N/A	Chip	0.1dBi for 2.4 GHz

Note: The antenna of EUT conforms to FCC 15.203.

Center Frequency of Each Channel:

-							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 00:	2402 MHz	Channel 20:	2422 MHz	Channel 40:	2442 MHz	Channel 60:	2462 MHz
Channel 01:	2403 MHz	Channel 21:	2423 MHz	Channel 41:	2443 MHz	Channel 61:	2463 MHz
Channel 02:	2404 MHz	Channel 22:	2424 MHz	Channel 42:	2444 MHz	Channel 62:	2464 MHz
Channel 03:	2405 MHz	Channel 23:	2425 MHz	Channel 43:	2445 MHz	Channel 63:	2465 MHz
Channel 04:	2406 MHz	Channel 24:	2426 MHz	Channel 44:	2446 MHz	Channel 64:	2466 MHz
Channel 05:	2407 MHz	Channel 25:	2427 MHz	Channel 45:	2447 MHz	Channel 65:	2467 MHz
Channel 06:	2408 MHz	Channel 26:	2428 MHz	Channel 46:	2448 MHz	Channel 66:	2468 MHz
Channel 07:	2409 MHz	Channel 27:	2429 MHz	Channel 47:	2449 MHz	Channel 67:	2469 MHz
Channel 08:	2410 MHz	Channel 28:	2430 MHz	Channel 48:	2450 MHz	Channel 68:	2470 MHz
Channel 09:	2411 MHz	Channel 29:	2431 MHz	Channel 49:	2451 MHz	Channel 69:	2471 MHz
Channel 10:	2412 MHz	Channel 30:	2432 MHz	Channel 50:	2452 MHz	Channel 70:	2472 MHz
Channel 11:	2413 MHz	Channel 31:	2433 MHz	Channel 51:	2453 MHz	Channel 71:	2473 MHz
Channel 12:	2414 MHz	Channel 32:	2434 MHz	Channel 52:	2454 MHz	Channel 72:	2474 MHz
Channel 13:	2415 MHz	Channel 33:	2435 MHz	Channel 53:	2455 MHz	Channel 73:	2475 MHz
Channel 14:	2416 MHz	Channel 34:	2436 MHz	Channel 54:	2456 MHz	Channel 74:	2476 MHz
Channel 15:	2417 MHz	Channel 35:	2437 MHz	Channel 55:	2457 MHz	Channel 75:	2477 MHz
Channel 16:	2418 MHz	Channel 36:	2438 MHz	Channel 56:	2458 MHz	Channel 76:	2478 MHz
Channel 17:	2419 MHz	Channel 37:	2439 MHz	Channel 57:	2459 MHz	Channel 77:	2479 MHz
Channel 18:	2420 MHz	Channel 38:	2440 MHz	Channel 58:	2460 MHz	Channel 78:	2480 MHz
Channel 19:	2421 MHz	Channel 39:	2441 MHz	Channel 59:	2461 MHz		

- 1. The EUT is a Portable Printer with a built-in Bluetooth V4.0, V3.0, V2.1+EDR transceiver, this report for Bluetooth V4.0, V3.0, V2.1+EDR.
- 2. These tests were conducted on a sample for the purpose of demonstrating compliance of Bluetooth transmitter with Part 15 Subpart C Paragraph 15.247 for spread spectrum devices.
- 3. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test
- 4. The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.
- 5. The EUT employs Adaptive Frequency Hopping (AFH) which identifies sources of interference namely devices operating in 802.11 WLAN and excludes them from the list of available channels. The process of re-mapping reduces the number of test channels from 79 channels to a minimum number of 20 channels.

Test Mode	Mode 1: Transmit - 1Mbps (GFSK)	
	Mode 1: Transmit - 2Mbps(π/4DQPSK)	
	Mode 2: Transmit - 3Mbps (8DPSK)	

1.2. Operational Description

The EUT is a Portable Printer with a built-in Bluetooth V4.0, V3.0, V2.1+EDR transceiver. The number of the channels is 79 in 2402-2480MHz. This device provides three kinds of transmitting speed and modulation, respectively GFSK(1Mbps) / π /4DQPSK(2Mbps) / 8DPSK(3Mbps). The antenna is Chip antenna and provides diversity function to improve the receiving function.

The system receivers have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shift frequencies in synchronization with the transmitted signals

Frequency hopping spread spectrum systems are not required to employ all available hopping channels during each transmission. The transmitter is presented with a continuous data stream. In addition, a system employing short transmission bursts must comply with the definition of a frequency hopping system and must distribute its 79 channels and over the minimum number of hopping channels (75 channels).

The incorporation of intelligence within a frequency hopping spread spectrum system that permits the system to recognize other users within the spectrum band so that it individually and independently chooses and adapts its hopsets to avoid hopping on occupied channels is permitted.

The coordination of frequency hopping systems in any other manner for the express purpose of avoiding the simultaneous occupancy of individual hopping frequencies by multiple transmitters is not permitted.

1.3. Tested System Details

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

Pro	oduct	Manufacturer	Model No.	Serial No.	Power Cord
1	Notebook PC	DELL	Latitude 5580	2HRD7H2	N/A
2	Adapter	HUAWEI	HW-050100C01	P77911J6K51311	N/A

Signal Cable Type		Signal cable Description
А	Signal Cable	Non-Shielded, 0.9m
В	USB Cable	Non-Shielded, 0.32m

1.4. Configuration of Tested System



1.5. EUT Exercise Software

- 1. Setup the EUT as shown in Section 1.4.
- 2. Execute software "Blue Tool v1.8.7.2" on the Notebook PC.
- 3. Configure the test mode, the test channel, and the data rate.
- 4. Press "OK" to start the continuous Transmit.
- 5. Verify that the EUT works properly.

1.6. Test Facility

Ambient conditions in the laboratory:

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	20-35
Humidity (%RH)	25-75	30-65
Barometric pressure (mbar)	860-1060	950-1000

The related certificate for our laboratories about the test site and management system can be downloaded from DEKRA Testing and Certification Co., Ltd. Web Site:

http://www.dekra.com.tw/english/about/certificates.aspx?bval=5

The address and introduction of DEKRA Testing and Certification Co., Ltd. laboratories can be founded in our Web site: <u>http://www.dekra.com.tw/index_en.aspx</u>

Site Description:	Accredited by TAF Accredited Number: 3023
Site Name: Site Address:	DEKRA Testing and Certification Co., Ltd No.5-22, Ruishukeng, Linkou Dist., New Taipei City 24451, Taiwan, R.O.C. TEL : 886-2-8601-3788 / FAX : 886-2-8601-3789
	E-Mail : info.tw@dekra.com

FCC Accreditation Number: TW3023



1.7. List of Test Equipment

For Conducted measurements /CB3/SR8

	Equipment	Manufacturer	Model No.	Serial No.	Cali. Date	Due. Date
	Temperature Chamber	WIT GROUP	TH-1S-B	EQ-201-00146	2018/02/12	2019/02/11
X	Spectrum Analyzer	Agilent	N9010A	MY48030495	2018/10/13	2019/10/12
Х	Peak Power Analyzer	Keysight	8990B	MY51000410	2018/08/01	2019/07/31
X	Wideband Power Sensor	Keysight	N1923A	MY56080003	2018/07/25	2019/07/24
X	Wideband Power Sensor	Keysight	N1923A	MY56080004	2018/07/25	2019/07/24
Х	EMI Test Receiver	R&S	ESCS 30	100369	2017/11/07	2018/11/06
Х	LISN	R&S	ESH3-Z5	836679/017	2018/02/09	2019/02/08
Х	LISN	R&S	ENV216	100097	2018/02/09	2019/02/08
Х	Coaxial Cable	DEKRA	RG 400	LC018-RG	2018/06/21	2019/06/20
	For Radiated measure	ments /Site3/CB8				
	Equipment	Manufacturer	Model No.	Serial No.	Cali. Date	Due. Date
Х	Spectrum Analyzer	R&S	FSP40	100170	2018/03/12	2019/03/11
	Loop Antenna	Teseq	HLA6121	37133	2018/10/13	2019/10/12
X	Bilog Antenna	Schaffner Chase	CBL6112B	2707	2018/06/24	2019/06/23
X	Coaxial Cable	DEKRA	RG 214	LC003-RG	2018/06/14	2019/06/13
X	Pre-Amplifier	Jet-Power	JPA-10M1G33	170101000330 010	2018/06/14	2019/06/13
Х	Horn Antenna	ETS-Lindgren	3117	00135205	2018/05/03	2019/05/02
X	Horn Antenna	SCHWARZBECK	9120D	576	2017/11/30	2018/11/29
X	Pre-Amplifier	EMCI	EMC012630SE	980210	2018/04/10	2019/04/09
	Horn Antenna	Com-Power	AH-840	101043	2018/01/09	2019/01/08
	Amplifier + Cable	EMCI	EMC184045SE	980370	2018/03/21	2019/03/20
X	Filter	MICRO-TRONICS	BRM50702	G270	2018/08/06	2019/08/05
	Filter	MICRO-TRONICS	BRM50716	G196	2018/08/06	2019/08/05

Note:

1. All equipments are calibrated every one year.

2. The test instruments marked with "X" are used to measure the final test results.

3. Test Software version :QuieTek EMI 2.0 V2.1.113.



2. Conducted Emission

2.1. Test Setup



2.2. Limits

FCC Part 15 Subpart C Paragraph 15.207 (dBµV) Limit					
Frequency MHz	Limits				
	QP	AV			
0.15 - 0.50	66-56	56-46			
0.50-5.0	56	46			
5.0 - 30	60	50			

Remarks: In the above table, the tighter limit applies at the band edges.

2.3. Test Procedure

The EUT and Peripherals are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm /50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs.)

Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all the interface cables must be changed according to ANSI C63.4: 2014 on conducted measurement.

Conducted emissions were invested over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

The EUT was setup to ANSI C63.4, 2014; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

2.4. Uncertainty

± 2.26 dB

2.5. Test Result of Conducted Emission

Product	:	Portable Printer
Test Item	:	Conducted Emission Test
Power Line	:	Line 1
Test date	:	2018/09/25
Test Mode	:	Mode 2: Transmit - 3Mbps (8DPSK) (2441MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBµV	dBµV	dB	dBµV
LINE 1					
Quasi-Peak					
0.197	9.738	15.120	24.858	-39.799	64.657
0.912	9.777	22.400	32.177	-23.823	56.000
1.568	9.804	18.980	28.784	-27.216	56.000
3.330	9.865	18.820	28.685	-27.315	56.000
10.802	10.086	34.400	44.486	-15.514	60.000
21.869	10.249	15.640	25.889	-34.111	60.000
Average					
0.197	9.738	1.410	11.148	-43.509	54.657
0.912	9.777	6.390	16.167	-29.833	46.000
1.568	9.804	5.010	14.814	-31.186	46.000
3.330	9.865	6.640	16.505	-29.495	46.000
10.802	10.086	17.680	27.766	-22.234	50.000
21.869	10.249	-0.760	9.489	-40.511	50.000

- 1. All Reading Levels are Quasi-Peak and average value.
- 2. " " means the worst emission level.
- 3. Measurement Level = Reading Level + Correct Factor



Product	:	Portable Printer
Test Item	:	Conducted Emission Test
Power Line	:	Line 2
Test date	:	2018/09/25
Test Mode	:	Mode 2: Transmit - 3Mbps (8DPSK) (2441MHz)

Frequency	quency Correct Reading		Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBµV	dBµV	dB	dBµV
LINE 2					
Quasi-Peak					
0.220	9.739	12.980	22.719	-41.281	64.000
0.525	9.741	17.620	27.361	-28.639	56.000
0.666	9.747	16.180	25.927	-30.073	56.000
2.013	9.822	7.640	17.462	-38.538	56.000
11.064	10.127	29.620	39.747	-20.253	60.000
20.224	10.384	15.120	25.504	-34.496	60.000
Average					
0.220	9.739	0.830	10.569	-43.431	54.000
0.525	9.741	10.290	20.031	-25.969	46.000
0.666	9.747	6.980	16.727	-29.273	46.000
2.013	9.822	1.450	11.272	-34.728	46.000
11.064	10.127	13.000	23.127	-26.873	50.000
20.224	10.384	2.770	13.154	-36.846	50.000

1. All Reading Levels are Quasi-Peak and average value.

2. " means the worst emission level.

3. Measurement Level = Reading Level + Correct Factor

3. Peak Power Output

3.1. Test Setup



3.2. Limit

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

3.3. Test Procedure

The EUT was setup to ANSI C63.4, 2014; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

3.4. Uncertainty

± 1.19 dB



3.5. Test Result of Peak Power Output

Product	:	Portable Printer
Test Item	:	Peak Power Output
Test Site	:	No.3 OATS
Test date	:	2018/09/28
Test Mode	:	Mode 1: Transmit - 1Mbps (GFSK)

Channel No.	Frequency	Measurement	Required Limit	Result
	(MHz)	(dBm)		
Channel 00	2402.00	6.85	0.125 Watt= 20.97 dBm	Pass
Channel 39	2441.00	7.05	0.125 Watt= 20.97 dBm	Pass
Channel 78	2480.00	6.59	0.125 Watt= 20.97 dBm	Pass

Note: For AFH mode using 20 hopping channels, the maximum output power limit is 0.125W.



:	Portable Printer
:	Peak Power Output
:	No.3 OATS
:	2018/10/13
:	Mode 1: Transmit - 2Mbps(π/4DQPSK)
	: : : :

Channel No.	Frequency	Measurement	Required Limit	Result
	(MHz)	(dBm)		
Channel 00	2402.00	6.07	0.125 Watt= 20.97 dBm	Pass
Channel 39	2441.00	6.15	0.125 Watt= 20.97 dBm	Pass
Channel 78	2480.00	5.27	0.125 Watt= 20.97 dBm	Pass

Note: For AFH mode using 20 hopping channels, the maximum output power limit is 0.125W



Product	:	Portable Printer
Test Item	:	Peak Power Output
Test Site	:	No.3 OATS
Test date	:	2018/09/28
Test Mode	:	Mode 2: Transmit - 3Mbps (8DPSK)

Channel No.	Frequency	Measurement	Required Limit	Result
	(MHz)	(dBm)		
Channel 00	2402.00	6.58	0.125 Watt= 20.97 dBm	Pass
Channel 39	2441.00	6.43	0.125 Watt= 20.97 dBm	Pass
Channel 78	2480.00	5.82	0.125 Watt= 20.97 dBm	Pass

Note: For AFH mode using 20 hopping channels, the maximum output power limit is 0.125W



To Controller

To Receiver

4. Radiated Emission

4.1. Test Setup

Under 30MHz

Test

Receiver



Fully soldered Metal Ground

Above 1GHz



4.2. Limits

General Radiated Emission Limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 20dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

FCC Part 15 Subpart C Paragraph 15.209 Limits								
Frequency MHz	Field strength	Measurement distance						
	(microvolts/meter)	(meter)						
0.009-0.490	2400/F(kHz)	300						
0.490-1.705	24000/F(kHz)	30						
1.705-30	30	30						
30-88	100	3						
88-216	150	3						
216-960	200	3						
Above 960	500	3						

Remarks: 1. RF Voltage $(dB\mu V) = 20 \log RF$ Voltage (uV)

- 2. In the Above Table, the tighter limit applies at the band edges.
- 3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

4.3. Test Procedure

The EUT was setup according to ANSI C63.10, 2013 and tested compliance to FCC 47CFR 15.247 requirements.

Measuring the frequency range below 1GHz, the EUT is placed on a turn table which is 0.8 meter above ground, when measuring the frequency range above 1GHz, the EUT is placed on a turn table which is 1.5 meter above ground.

The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna is scanned between 1 meter and 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10: 2013 on radiated measurement.

The resolution bandwidth below 30MHz setting on the field strength meter is 9kHz and 30MHz~1GHz is 120kHz and above 1GHz is 1MHz.

Radiated emission measurements below 30MHz are made using Loop Antenna and 30MHz~1GHz are made using broadband Bilog antenna and above 1GHz are made using Horn Antennas.

The measurement is divided into the Preliminary Measurement and the Final Measurement.

The suspected frequencies are searched for in Preliminary Measurement with the measurement antenna kept pointed at the source of the emission both in azimuth and elevation, with the polarization of the antenna oriented for maximum response. The antenna is pointed at an angle towards the source of the emission, and the EUT is rotated in both height and polarization to maximize the measured emission. The emission is kept within the illumination area of the 3 dB bandwidth of the antenna. The worst radiated emission is measured in the Open Area Test Site on the Final Measurement.

The measurement frequency range form 9kHz - 10th Harmonic of fundamental was investigated.

4.4. Uncertainty

 \pm 4.08 dB above 1GHz

± 4.22 dB below 1GHz



4.5. Test Result of Radiated Emission

Product	:	: Portable Printer							
Test Item	:	Harmonic Radiated Emission							
Test Site	:	No.3 OATS							
Test date	:	2018/09/21							
Test Mode	:	Mode 1: Trans	smit - 1Mbps (G	FSK)(2402MHz)					
Frequency		Correct	Reading	Measurement	Margin	Limit			
		Factor	Level	Level					
MHz		dB	dBµV	$dB\mu V/m$	dB	dBµV/m			
Horizontal									
Peak Detector:									
4804.000		2.511	42.030	44.540	-29.460	74.000			
7206.000		9.511	42.060	51.571	-22.429	74.000			
9608.000		10.394	40.290	50.684	-23.316	74.000			
Average									
Detector:									
Vertical									
Peak Detector:									
4804.000		2.923	42.040	44.962	-29.038	74.000			
7206.000		9.988	41.930	51.919	-22.081	74.000			
9608.000		10.847	40.300	51.147	-22.853	74.000			
Average									
Detector:									

--

Note:

-

- 1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- 4. Measurement Level = Reading Level + Correct Factor.
- 5. Correct Factor = Antenna factor + Cable loss Amplifier gain.
- 6. The average measurement was not performed when the peak measured data under the limit of average detection.
- 7. The emission levels of other frequencies are very lower than the limit and not show in test report.



Product	:	Portable Printer								
Test Item	:	Harmonic Radiated Emission								
Test Site	:	No.3 OATS	No.3 OATS							
Test date	:	2018/09/21								
Test Mode	:	Mode 1: Tra	nsmit - 1Mbps (G	FSK)(2441MHz)						
Frequency		Correct	Reading	Measurement	Margin	Limit				
		Factor	Level	Level						
MHz		dB	dBµV	$dB\mu V/m$	dB	dBµV/m				
Horizontal										
Peak Detector:										
4882.000		2.025	42.460	44.485	-29.515	74.000				
7323.000		9.762	40.670	50.431	-23.569	74.000				
9764.000		9.682	39.940	49.621	-24.379	74.000				
Average										
Detector:										
Vertical										
Peak Detector:										
4882.000		2.488	42.370	44.858	-29.142	74.000				
7323.000		10.375	40.930	51.304	-22.696	74.000				
9764.000		10.315	39.720	50.035	-23.965	74.000				
Average										
Detector:										

- 1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- 4. Measurement Level = Reading Level + Correct Factor.
- 5. Correct Factor = Antenna factor + Cable loss Amplifier gain.
- 6. The average measurement was not performed when the peak measured data under the limit of average detection.
- 7. The emission levels of other frequencies are very lower than the limit and not show in test report.



Product	:	Portable Printer						
Test Item	:	Harmonic Radiated Emission						
Test Site	:	No.3 OATS						
Test date	:	2018/09/21						
Test Mode	:	Mode 1: Tra	nsmit - 1Mbps (G	FSK)(2480MHz)				
Frequency		Correct	Reading	Measurement	Margin	Limit		
		Factor	Level	Level				
MHz		dB	dBµV	dBµV/m	dB	dBµV/m		
Horizontal								
Peak Detector:								
4960.000		2.582	41.220	43.802	-30.198	74.000		
7440.000		10.555	38.820	49.375	-24.625	74.000		
9920.000		10.206	41.520	51.726	-22.274	74.000		
Average								
Detector:								
Vertical								
Peak Detector:								
4960.000		3.398	42.110	45.509	-28.491	74.000		
7440.000		11.214	39.260	50.474	-23.526	74.000		
9920.000		11.245	41.670	52.915	-21.085	74.000		
Average								
Detector:								

- 1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- 4. Measurement Level = Reading Level + Correct Factor.
- 5. Correct Factor = Antenna factor + Cable loss Amplifier gain.
- 6. The average measurement was not performed when the peak measured data under the limit of average detection.
- 7. The emission levels of other frequencies are very lower than the limit and not show in test report.



Product	:	Portable Printer								
Test Item	:	Harmonic R	Harmonic Radiated Emission							
Test Site	:	No.3 OATS	No.3 OATS							
Test date	:	2018/10/12								
Test Mode	:	Mode 1: Tra	nsmit - 2Mbps $(\pi/4$	4DQPSK) (2402MHz						
_		_								
Frequency		Correct	Reading	Measurement	Margin	Limit				
		Factor	Level	Level						
MHz		dB	dBµV	dBµV/m	dB	dBµV/m				
Horizontal										
Peak Detector:										
4804.000		2.511	39.287	41.798	-32.202	74.000				
7206.000		9.511	37.682	47.193	-26.807	74.000				
9608.000		10.394	36.653	47.047	-26.953	74.000				
Average										
Detector:										
Vertical										
Peak Detector:										
4804.000		2.923	39.710	42.632	-31.368	74.000				
7206.000		9.988	37.675	47.664	-26.336	74.000				
9608.000		10.847	37.360	48.207	-25.793	74.000				
Average										
Detector:										

- 1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- 4. Measurement Level = Reading Level + Correct Factor.
- 5. Correct Factor = Antenna factor + Cable loss Amplifier gain.
- 6. The average measurement was not performed when the peak measured data under the limit of average detection.
- 7. The emission levels of other frequencies are very lower than the limit and not show in test report.



Product	:	Portable Printer								
Test Item	:	Harmonic R	Harmonic Radiated Emission							
Test Site	:	No.3 OATS	No.3 OATS							
Test date	:	2018/10/12								
Test Mode	:	Mode 1: Tra	nsmit - 2Mbps $(\pi/4$	4DQPSK) (2441MHz						
Frequency		Correct	Reading	Measurement	Margin	Limit				
		Factor	Level	Level						
MHz		dB	dBµV	dBµV/m	dB	dBµV/m				
Horizontal										
Peak Detector:										
4882.000		2.025	39.345	41.370	-32.630	74.000				
7323.000		9.762	36.964	46.725	-27.275	74.000				
9764.000		9.682	37.511	47.192	-26.808	74.000				
Average										
Detector:										
Vertical										
Peak Detector:										
4882.000		2.488	39.239	41.727	-32.273	74.000				
7323.000		10.375	36.457	46.831	-27.169	74.000				
9764.000		10.315	37.399	47.714	-26.286	74.000				
Average										
Detector:										

- 1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- 4. Measurement Level = Reading Level + Correct Factor.
- 5. Correct Factor = Antenna factor + Cable loss Amplifier gain.
- 6. The average measurement was not performed when the peak measured data under the limit of average detection.
- 7. The emission levels of other frequencies are very lower than the limit and not show in test report.



Product	luct : Portable Printer								
Test Item	: Ha	Harmonic Radiated Emission							
Test Site	: No	.3 OATS							
Test date	: 20	18/10/12							
Test Mode	: Mo	ode 1: Tra	nsmit - 2Mbps($\pi/4$	4DQPSK) (2480MH	[z)				
Frequency	Co	rrect	Reading	Measurement	Margin	Limit			
	Fa	ctor	Level	Level					
MHz	Ċ	lB	dBµV	$dB\mu V/m$	dB	dBµV/m			
Horizontal									
Peak Detector:									
4960.000	2	582	38.403	40.985	-33.015	74.000			
7440.000	10	.555	36.269	46.824	-27.176	74.000			
9920.000	10	.206	37.734	47.940	-26.060	74.000			
Average									
Detector:									
Vertical									
Peak Detector:									
4960.000	2	582	39.620	42.202	-31.798	74.000			
7440.000	10	.555	36.164	46.719	-27.281	74.000			
9920.000	11.	.245	37.501	48.746	-25.254	74.000			
Average									
Detector:									

- 1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- 4. Measurement Level = Reading Level + Correct Factor.
- 5. Correct Factor = Antenna factor + Cable loss Amplifier gain.
- 6. The average measurement was not performed when the peak measured data under the limit of average detection.
- 7. The emission levels of other frequencies are very lower than the limit and not show in test report.



Product	:	Portable Printer								
Test Item	:	Harmonic R	Harmonic Radiated Emission							
Test Site	:	No.3 OATS	No.3 OATS							
Test date	:	2018/09/21								
Test Mode	:	Mode 2: Tra	ansmit - 3Mbps (8I	OPSK)(2402MHz)						
Frequency		Correct	Reading	Measurement	Margin	Limit				
		Factor	Level	Level	8					
MHz		dB	dBμV	dBµV/m	dB	$dB\mu V/m$				
Horizontal										
Peak Detector:										
4804.000		2.511	41.540	44.050	-29.950	74.000				
7206.000		9.511	41.570	51.081	-22.919	74.000				
9608.000		10.394	40.010	50.404	-23.596	74.000				
Average										
Detector:										
Vertical										
Peak Detector:										
4804.000		2.923	42.090	45.012	-28.988	74.000				
7206.000		9.988	41.450	51.439	-22.561	74.000				
9608.000		10.847	40.220	51.067	-22.933	74.000				
Average										
Detector:										

- 1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- 4. Measurement Level = Reading Level + Correct Factor.
- 5. Correct Factor = Antenna factor + Cable loss Amplifier gain.
- 6. The average measurement was not performed when the peak measured data under the limit of average detection.
- 7. The emission levels of other frequencies are very lower than the limit and not show in test report.



Product	:	Portable Printer
Test Item	:	Harmonic Radiated Emission
Test Site	:	No.3 OATS
Test date	:	2018/09/21
Test Mode	:	Mode 2: Transmit - 3Mbps (8DPSK) (2441MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBµV	$dB\mu V/m$	dB	dBµV/m
Horizontal					
Peak Detector:					
4882.000	2.025	41.650	43.675	-30.325	74.000
7323.000	9.762	40.540	50.301	-23.699	74.000
9764.000	9.682	39.560	49.241	-24.759	74.000
Average					
Detector:					
Vertical					
Peak Detector:					
4882.000	2.488	42.540	45.028	-28.972	74.000
7323.000	10.375	40.820	51.194	-22.806	74.000
9764.000	10.315	39.260	49.575	-24.425	74.000
Average					
Detector:					

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- 1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- 4. Measurement Level = Reading Level + Correct Factor.
- 5. Correct Factor = Antenna factor + Cable loss Amplifier gain.
- 6. The average measurement was not performed when the peak measured data under the limit of average detection.
- 7. The emission levels of other frequencies are very lower than the limit and not show in test report.



:	Portable Printer					
:	Harmonic Radiated Emission					
:	No.3 OATS					
:	2018/09/21					
:	Mode 2: Transmit - 3Mbps (8DPSK) (2480MHz)					
	Correct	Reading	Measurement	Margin	Limit	
	Factor	Level	Level			
	dB	dBµV	$dB\mu V/m$	dB	dBµV/m	
	2.582	41.220	43.802	-30.198	74.000	
	10.555	39.520	50.075	-23.925	74.000	
	10.206	41.690	51.896	-22.104	74.000	
	3.398	42.160	45.559	-28.441	74.000	
	11.214	39.300	50.514	-23.486	74.000	
	11.245	41.300	52.545	-21.455	74.000	
		 Portable Pri Harmonic R No.3 OATS 2018/09/21 Mode 2: Tra Correct Factor dB 2.582 10.555 10.206 3.398 11.214 11.245 	 Portable Printer Harmonic Radiated Emission No.3 OATS 2018/09/21 Mode 2: Transmit - 3Mbps (8) Correct Reading Factor Level dB dBμV 2.582 41.220 10.555 39.520 10.206 41.690 3.398 42.160 11.214 39.300 11.245 41.300 	 Portable Printer Harmonic Radiated Emission No.3 OATS 2018/09/21 Mode 2: Transmit - 3Mbps (8DPSK) (2480MHz) Correct Reading Measurement Factor Level Level dB dBµV dBµV/m 2.582 41.220 43.802 10.555 39.520 50.075 10.206 41.690 51.896 3.398 42.160 45.559 11.214 39.300 50.514 11.245 41.300 52.545 	 Portable Printer Harmonic Radiated Emission No.3 OATS 2018/09/21 Mode 2: Transmit - 3Mbps (8DPSK) (2480MHz) Correct Reading Measurement Margin Factor Level Level dB dBµV dBµV/m dB 2.582 41.220 43.802 -30.198 10.555 39.520 50.075 -23.925 10.206 41.690 51.896 -22.104 3.398 42.160 45.559 -28.441 11.214 39.300 50.514 -23.486 11.245 41.300 52.545 -21.455 	

- 1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- 4. Measurement Level = Reading Level + Correct Factor.
- 5. Correct Factor = Antenna factor + Cable loss Amplifier gain.
- 6. The average measurement was not performed when the peak measured data under the limit of average detection.
- 7. The emission levels of other frequencies are very lower than the limit and not show in test report.



:	Portable Printer
:	General Radiated Emission
:	No.3 OATS
:	2018/09/21
:	Mode 1: Transmit - 1Mbps (GFSK) (2441MHz)
	: : : :

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBµV	$dB\mu V/m$	dB	dBµV/m
Horizontal					
105.913	-7.662	43.096	35.434	-8.066	43.500
257.739	-5.430	33.294	27.864	-18.136	46.000
389.884	0.997	34.842	35.839	-10.161	46.000
604.971	4.308	27.187	31.495	-14.505	46.000
790.536	6.364	28.531	34.895	-11.105	46.000
924.087	6.595	28.502	35.097	-10.903	46.000
Vertical					
105.913	-4.505	41.511	37.006	-6.494	43.500
365.986	0.215	26.879	27.095	-18.905	46.000
455.957	-3.662	31.076	27.414	-18.586	46.000
540.304	2.156	26.374	28.530	-17.470	46.000
686.507	2.272	28.147	30.419	-15.581	46.000
810.217	2.975	29.679	32.654	-13.346	46.000

- 1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- 4. Measurement Level = Reading Level + Correct Factor.
- 5. Correct Factor = Antenna factor + Cable loss Amplifier gain.
- 6. The average measurement was not performed when the peak measured data under the limit of average detection.
- 7. The emission levels of other frequencies are very lower than the limit and not show in test report.



Product	:	Portable Printer
Test Item	:	General Radiated Emission
Test Site	:	No.3 OATS
Test date	:	2018/10/12
Test Mode	:	Mode 1: Transmit - 2Mbps(π /4DQPSK)(2441MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBµV	dBµV/m	dB	dBµV/m
Horizontal					
168.710	-9.771	47.162	37.391	-6.109	43.500
314.210	-4.639	43.204	38.565	-7.435	46.000
435.460	0.873	35.457	36.330	-9.670	46.000
508.210	2.760	36.123	38.883	-7.117	46.000
678.930	2.822	29.363	32.185	-13.815	46.000
822.490	7.179	29.948	37.127	-8.873	46.000
Vertical					
145.430	-5.479	40.235	34.756	-8.744	43.500
168.710	-4.431	41.197	36.766	-6.734	43.500
290.930	-5.418	37.625	32.207	-13.793	46.000
363.680	0.079	36.346	36.425	-9.575	46.000
605.210	2.269	27.545	29.814	-16.186	46.000
810.850	2.878	27.391	30.269	-15.731	46.000

- 1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- 4. Measurement Level = Reading Level + Correct Factor.
- 5. Correct Factor = Antenna factor + Cable loss Amplifier gain.
- 6. The average measurement was not performed when the peak measured data under the limit of average detection.
- 7. The emission levels of other frequencies are very lower than the limit and not show in test report.



Product	:	Portable Printer
Test Item	:	General Radiated Emission
Test Site	:	No.3 OATS
Test date	:	2018/09/21
Test Mode	:	Mode 2: Transmit - 3Mbps (8DPSK) (2441MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBµV	$dB\mu V/m$	dB	dBµV/m
Horizontal					
145.275	-7.726	44.964	37.238	-6.262	43.500
252.116	-5.836	34.526	28.690	-17.310	46.000
419.406	-0.249	33.478	33.229	-12.771	46.000
547.333	4.154	29.774	33.928	-12.072	46.000
648.551	1.702	31.619	33.320	-12.680	46.000
845.362	6.489	27.626	34.115	-11.885	46.000
Vertical					
143.870	-5.516	39.654	34.138	-9.362	43.500
340.681	-1.238	36.453	35.215	-10.785	46.000
534.681	1.313	29.150	30.462	-15.538	46.000
689.319	2.301	28.082	30.383	-15.617	46.000
790.536	2.692	28.881	31.573	-14.427	46.000
929.710	3.807	26.694	30.501	-15.499	46.000

- 1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- 4. Measurement Level = Reading Level + Correct Factor.
- 5. Correct Factor = Antenna factor + Cable loss Amplifier gain.
- 6. The average measurement was not performed when the peak measured data under the limit of average detection.
- 7. The emission levels of other frequencies are very lower than the limit and not show in test report.
- 8. No emission found between lowest internal used/generated frequency to 30MHz.

5. **RF Antenna Conducted Test**

5.1. Test Setup



5.2. Limits

According to FCC Section 15.247(d). In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

5.3. Test Procedure

The EUT was setup to ANSI C63.4, 2014; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

5.4. Uncertainty

± 1.20dB

5.5. Test Result of RF Antenna Conducted Test

Product	:	Portable Printer
Test Item	:	RF Antenna Conducted Test
Test Site	:	No.3 OATS
Test date	:	2018/09/25
Test Mode	:	Mode 1: Transmit - 1Mbps (GFSK)



Figure Channel 39:



Figure Channel 78:



Note: The above test pattern is synthesized by multiple of the frequency range.



Product	:	Portable Printer
Test Item	:	RF Antenna Conducted Test
Test Site	:	No.3 OATS
Test date	:	2018/10/12
Test Mode	:	Mode 1: Transmit - 2Mbps(π/4DQPSK)







Note: The above test pattern is synthesized by multiple of the frequency range.


Product	:	Portable Printer
Test Item	:	RF Antenna Conducted Test
Test Site	:	No.3 OATS
Test date	:	2018/09/25
Test Mode	:	Mode 2: Transmit - 3Mbps (8DPSK)



Figure Channel 39:



Figure Channel 78:



Note: The above test pattern is synthesized by multiple of the frequency range.



6. Band Edge

6.1. Test Setup

RF Radiated Measurement:

Above 1GHz



RF Conducted Measurement



6.2. Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

6.3. Test Procedure

The EUT is placed on a turn table which is 1.5 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.10: 2013 on radiated measurement.

The bandwidth setting below 1GHz and above 1GHz on the field strength meter is 120 kHz and 1MHz, respectively.

6.4. Uncertainty

- \pm 4.08 dB above 1GHz
- ± 4.22 dB below 1GHz



6.5. **Test Result of Band Edge**

Product	:	Portable Printer
Test Item	:	Band Edge
Test Site	:	No.3 OATS
Test date	:	2018/09/11
Test Mode	:	Mode 1: Transmit - 1Mbps (GFSK) (2402MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Arerage Limit (dBuV/m)	Result
00 (Peak)	2378.100	-2.739	58.112	55.372	74.00	54.00	Pass
00 (Peak)	2390.000	-2.687	47.954	45.267	74.00	54.00	Pass
00 (Peak)	2400.000	-2.660	68.747	66.087			
00 (Peak)	2401.800	-2.658	102.406	99.748			
00 (Average)	2378.100	-2.739	50.437	47.697	74.00	54.00	Pass
00 (Average)	2390.000	-2.687	36.869	34.182	74.00	54.00	Pass
00 (Average)	2400.000	-2.660	49.522	46.862			
00 (Average)	2402.000	-2.657	88.572	85.915			



Figure Channel 00:

Horizontal (Average)



- All readings above 1GHz are performed with peak and/or average measurements as necessary. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto. "*", means this data is the worst emission level. Measurement Level = Reading Level + Correction Factor. 1.
- 2. 3.
- 4. 5.
- The average measurement was not performed when the peak measured data is under the limit of 6. average detection.



Product	:	Portable Printer
Test Item	:	Band Edge
Test Site	:	No.3 OATS
Test date	:	2018/09/11
Test Mode	:	Mode 1: Transmit - 1Mbps (GFSK) (2402MHz)

RF Radiated Measurement (VERTICAL):

Channel No.	Frequency	Correct Factor	Reading Level	Emission Level	Peak Limit	Arerage Limit	Dogult
Channel No.	(MHz)	(dB)	(dBµV)	(dBµV/m)	$(dB\mu V/m)$	$(dB\mu V/m)$	Result
00 (Peak)	2377.900	-4.119	52.980	48.861	74.00	54.00	Pass
00 (Peak)	2390.000	-4.159	48.667	44.508	74.00	54.00	Pass
00 (Peak)	2400.000	-4.171	66.761	62.590			
00 (Peak)	2402.200	-4.171	98.345	94.174			
00 (Average)	2378.000	-4.119	44.579	40.460	74.00	54.00	Pass
00 (Average)	2390.000	-4.159	36.748	32.589	74.00	54.00	Pass
00 (Average)	2400.000	-4.171	46.270	42.099			
00 (Average)	2402.000	-4.171	85.315	81.144			









VERTICAL (Average)



- All readings above 1GHz are performed with peak and/or average measurements as necessary. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto. "*", means this data is the worst emission level. 1. 2. 3. 4.

- 5. Measurement Level = Reading Level + Correction Factor.
- The average measurement was not performed when the peak measured data is under the limit of 6. average detection.



Product	:	Portable Printer
Test Item	:	Band Edge
Test Site	:	No.3 OATS
Test date	:	2018/09/11
Test Mode	:	Mode 1: Transmit - 1Mbps (GFSK) (2480MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency	Correct Factor	Reading Level	Emission Level	Peak Limit	Arerage Limit	Dogult
Channel No.	(MHz)	(dB)	(dBµV)	$(dB\mu V/m)$	$(dB\mu V/m)$	$(dB\mu V/m)$	Result
78 (Peak)	2480.200	-2.605	100.415	97.810			Pass
78 (Peak)	2483.500	-2.601	49.234	46.632	74.00	54.00	Pass
78 (Peak)	2503.900	-2.632	54.703	52.071	74.00	54.00	Pass
78 (Average)	2480.100	-2.605	86.984	84.379			Pass
78 (Average)	2483.500	-2.601	37.676	35.074	74.00	54.00	Pass
78 (Average)	2504.100	-2.633	46.905	44.272	74.00	54.00	Pass





- All readings above 1GHz are performed with peak and/or average measurements as necessary. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto. "*", means this data is the worst emission level. Measurement Level = Reading Level + Correction Factor. 1.
- 2. 3.

- 4. 5.
- The average measurement was not performed when the peak measured data is under the limit of 6. average detection.



Product	:	Portable Printer
Test Item	:	Band Edge
Test Site	:	No.3 OATS
Test date	:	2018/09/11
Test Mode	:	Mode 1: Transmit - 1Mbps (GFSK) (2480MHz)

RF Radiated Measurement (VERTICAL):

Channel No.	Frequency	Correct Factor	Reading Level	Emission Level	Peak Limit	Arerage Limit	Dogult
Channel No.	(MHz)	(dB)	(dBµV)	(dBµV/m)	$(dB\mu V/m)$	$(dB\mu V/m)$	Result
78 (Peak)	2479.900	-3.978	97.905	93.927			Pass
78 (Peak)	2483.500	-3.966	49.224	45.257	74.00	54.00	Pass
78 (Peak)	2504.100	-3.891	53.875	49.985	74.00	54.00	Pass
78 (Average)	2480.000	-3.978	84.996	81.018			Pass
78 (Average)	2483.500	-3.966	37.429	33.462	74.00	54.00	Pass
78 (Average)	2504.000	-3.891	45.654	41.763	74.00	54.00	Pass

Figure Channel 78:

VERTICAL (Peak)



Figure Channel 78:

VERTICAL (Average)



- All readings above 1GHz are performed with peak and/or average measurements as necessary. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto. "*", means this data is the worst emission level. 1.
- 1. 2. 3. 4.

- 5. Measurement Level = Reading Level + Correction Factor.
- 6. The average measurement was not performed when the peak measured data is under the limit of average detection.



- Product Portable Printer •
- Test Item Band Edge
- Test Site • No.3 OATS
- Test date 2018/10/12 •

Test Mode Mode 1: Transmit - $2Mbps(\pi/4DQPSK)$ (2402MHz) :

RF Radiated Measurement (Horizontal):

Channel No.	Frequency	Correct Factor	Reading Level	Emission Level	Peak Limit	Arerage Limit	Docult
Channel No.	(MHz)	(dB)	(dBµV)	$(dB\mu V/m)$	$(dB\mu V/m)$	$(dB\mu V/m)$	Result
00 (Peak)	2377.700	-2.741	56.708	53.967	74.00	54.00	Pass
00 (Peak)	2390.000	-2.687	49.765	47.078	74.00	54.00	Pass
00 (Peak)	2400.000	-2.660	68.685	66.025			
00 (Peak)	2401.900	-2.658	101.193	98.535			
00 (Average)	2378.000	-2.740	47.757	45.017	74.00	54.00	Pass
00 (Average)	2390.000	-2.687	37.020	34.333	74.00	54.00	Pass
00 (Average)	2400.000	-2.660	53.665	51.005			
00 (Average)	2402.000	-2.657	85.232	82.575			

Figure Channel 00:







Horizontal (Average)



- All readings above 1GHz are performed with peak and/or average measurements as necessary. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto. 1. 2. 3.
- Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto. "*", means this data is the worst emission level.
- 4.
- 5. Measurement Level = Reading Level + Correction Factor.
- The average measurement was not performed when the peak measured data is under the limit of 6. average detection.



:	Portable Printer
:	Band Edge
:	No.3 OATS
:	2018/10/12
:	Mode 1: Transmit - 2Mbps(π/4DQPSK) (2402MHz)
	: : : :

RF Radiated Measurement (VERTICAL):

Channel No.	Frequency	Correct Factor	Reading Level	Emission Level	Peak Limit	Arerage Limit	Docult
Channel No.	(MHz)	(dB)	(dBµV)	(dBµV/m)	$(dB\mu V/m)$	$(dB\mu V/m)$	Result
00 (Peak)	2378.200	-4.119	54.027	49.907	74.00	54.00	Pass
00 (Peak)	2390.000	-4.159	47.935	43.776	74.00	54.00	Pass
00 (Peak)	2400.000	-4.171	65.435	61.264			
00 (Peak)	2402.200	-4.171	98.336	94.165			
00 (Average)	2378.000	-4.119	45.027	40.908	74.00	54.00	Pass
00 (Average)	2390.000	-4.159	36.756	32.597	74.00	54.00	Pass
00 (Average)	2400.000	-4.171	51.635	47.464			
00 (Average)	2402.000	-4.171	82.927	78.756			

Figure Channel 00:





Figure Channel 00:



- All readings above 1GHz are performed with peak and/or average measurements as necessary. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto. "*", means this data is the worst emission level. 1. 2. 3. 4.

- 5. Measurement Level = Reading Level + Correction Factor.
- The average measurement was not performed when the peak measured data is under the limit of 6. average detection.



Product	:	Portable Printer
Test Item	:	Band Edge
Test Site	:	No.3 OATS
Test date	:	2018/10/12
Test Mode	:	Mode 1: Transmit - $2Mbps(\pi/4DQPSK)$ (2480MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency	Correct Factor	Reading Level	Emission Level	Peak Limit	Arerage Limit	Dogult
Channel No.	(MHz)	(dB)	(dBµV)	(dBµV/m)	$(dB\mu V/m)$	$(dB\mu V/m)$	Result
78 (Peak)	2480.200	-2.605	95.110	92.505			Pass
78 (Peak)	2483.500	-2.601	49.253	46.651	74.00	54.00	Pass
78 (Peak)	2504.000	-2.633	51.497	48.865	74.00	54.00	Pass
78 (Average)	2480.000	-2.605	80.417	77.812			Pass
78 (Average)	2483.500	-2.601	37.068	34.466	74.00	54.00	Pass
78 (Average)	2504.000	-2.633	40.152	37.520	74.00	54.00	Pass





- All readings above 1GHz are performed with peak and/or average measurements as necessary. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto. "*", means this data is the worst emission level. Measurement Level = Reading Level + Correction Factor.
- 1. 2. 3.
- 4. 5.
- The average measurement was not performed when the peak measured data is under the limit of 6. average detection.



- Product Portable Printer ٠ Test Item Band Edge :
- Test Site No.3 OATS :
- Test date 2018/10/12 :

Test Mode Mode 1: Transmit - 2Mbps(π /4DQPSK) (2480MHz) :

RF Radiated Measurement (VERTICAL):

Channel No	Frequency	Correct Factor	Reading Level	Emission Level	Peak Limit	Arerage Limit	Posult
Channel No.	(MHz)	(dB)	(dBµV)	(dBµV/m)	$(dB\mu V/m)$	$(dB\mu V/m)$	Kesun
78 (Peak)	2479.900	-3.978	90.593	86.615			Pass
78 (Peak)	2483.500	-3.966	48.801	44.834	74.00	54.00	Pass
78 (Average)	2480.000	-3.978	76.820	72.842			Pass
78 (Average)	2483.500	-3.966	36.937	32.970	74.00	54.00	Pass
78 (Average)	2504.200	-3.889	38.147	34.257	74.00	54.00	Pass

Figure Channel 78:

VERTICAL (Peak)



Figure Channel 78:

VERTICAL (Average)



- All readings above 1GHz are performed with peak and/or average measurements as necessary. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto. "*", means this data is the worst emission level. 1.
- 2. 3.
- 4.
- Measurement Level = Reading Level + Correction Factor. 5.
- The average measurement was not performed when the peak measured data is under the limit of 6. average detection.



Product	:	Portable Printer
Test Item	:	Band Edge
Test Site	:	No.3 OATS
Test date	:	2018/09/11
Test Mode	:	Mode 2: Transmit - 3Mbps (8DPSK) (2402MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency	Correct Factor	Reading Level	Emission Level	Peak Limit	Arerage Limit	Dogult
Channel No.	(MHz)	(dB)	(dBµV)	(dBµV/m)	$(dB\mu V/m)$	$(dB\mu V/m)$	Result
00 (Peak)	2378.000	-2.740	57.105	54.365	74.00	54.00	Pass
00 (Peak)	2390.000	-2.687	48.914	46.227	74.00	54.00	Pass
00 (Peak)	2400.000	-2.660	69.078	66.418			
00 (Peak)	2402.000	-2.657	101.842	99.185			
00 (Average)	2378.100	-2.739	47.771	45.031	74.00	54.00	Pass
00 (Average)	2390.000	-2.687	36.805	34.118	74.00	54.00	Pass
00 (Average)	2400.000	-2.660	53.983	51.323			
00 (Average)	2402.100	-2.657	85.526	82.869			

Figure Channel 00:





Horizontal (Average)



- All readings above 1GHz are performed with peak and/or average measurements as necessary. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto. "*", means this data is the worst emission level.
- 1. 2. 3.
- 4.
- Measurement Level = Reading Level + Correction Factor. 5.
- The average measurement was not performed when the peak measured data is under the limit of average detection. 6.



Product	:	Portable Printer
Test Item	:	Band Edge
Test Site	:	No.3 OATS
Test date	:	2018/09/11
Test Mode	:	Mode 2: Transmit - 3Mbps (8DPSK) (2402MHz)

RF Radiated Measurement (VERTICAL):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Emission Level (dBµV/m)	Peak Limit (dBµV/m)	Arerage Limit (dBµV/m)	Result
00 (Peak)	2378.000	-4.119	51.935	47.816	74.00	54.00	Pass
00 (Peak)	2390.000	-4.159	47.989	43.830	74.00	54.00	Pass
00 (Peak)	2400.000	-4.171	64.548	60.377			
00 (Peak)	2402.000	-4.171	97.719	93.548			
00 (Average)	2378.200	-4.119	42.072	37.952	74.00	54.00	Pass
00 (Average)	2390.000	-4.159	36.761	32.602	74.00	54.00	Pass
00 (Average)	2400.000	-4.171	51.214	47.043			
00 (Average)	2402.100	-4.171	82.275	78.104			

Figure Channel 00:



Figure Channel 00:

VERTICAL (Average)



- All readings above 1GHz are performed with peak and/or average measurements as necessary. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto. "*", means this data is the worst emission level. 1.
- 2. 3. 4.

- 5. Measurement Level = Reading Level + Correction Factor.
- The average measurement was not performed when the peak measured data is under the limit of 6. average detection.



Product	:	Portable Printer
Test Item	:	Band Edge
Test Site	:	No.3 OATS
Test date	:	2018/09/11
Test Mode	:	Mode 2: Transmit - 3Mbps (8DPSK) (2480MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Emission Level (dBµV/m)	Peak Limit (dBµV/m)	Arerage Limit (dBµV/m)	Result
78 (Peak)	2480.000	-2.605	99.472	96.867			Pass
78 (Peak)	2483.500	-2.601	48.812	46.210	74.00	54.00	Pass
78 (Peak)	2504.000	-2.633	53.806	51.174	74.00	54.00	Pass
78 (Average)	2480.100	-2.605	83.615	81.010			Pass
78 (Average)	2483.500	-2.601	37.406	34.804	74.00	54.00	Pass
78 (Average)	2504.100	-2.633	43.735	41.102	74.00	54.00	Pass



Horizontal (Peak)





Horizontal (Average)



- All readings above 1GHz are performed with peak and/or average measurements as necessary. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto. "*", means this data is the worst emission level. 1.
- 2. 3. 4. 5.
- Measurement Level = Reading Level + Correction Factor.
- The average measurement was not performed when the peak measured data is under the limit of 6. average detection.



Product	:	Portable Printer
Test Item	:	Band Edge
Test Site	:	No.3 OATS
Test date	:	2018/09/11
Test Mode	:	Mode 2: Transmit - 3Mbps (8DPSK) (2480MHz)

......

RF Radiated Measurement (VERTICAL):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Emission Level (dBµV/m)	Peak Limit (dBµV/m)	Arerage Limit (dBµV/m)	Result
78 (Peak)	2480.000	-3.978	96.989	93.011			Pass
78 (Peak)	2483.500	-3.966	49.269	45.302	74.00	54.00	Pass
78 (Peak)	2503.900	-3.891	53.222	49.331	74.00	54.00	Pass
78 (Average)	2480.000	-3.978	81.641	77.663			Pass
78 (Average)	2483.500	-3.966	37.281	33.314	74.00	54.00	Pass
78 (Average)	2504.100	-3.891	42.603	38.713	74.00	54.00	Pass



.

VERTICAL (Peak)





VERTICAL (Average)



- All readings above 1GHz are performed with peak and/or average measurements as necessary. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto. "*", means this data is the worst emission level.
- 1. 2. 3.
- 4.
- 5.
- Measurement Level = Reading Level + Correction Factor. The average measurement was not performed when the peak measured data is under the limit of 6. average detection.



:	Portable Printer
:	Band Edge
:	No.3 OATS
:	2018/09/25
:	Mode 1: Transmit - 1Mbps (GFSK)(Hopping off)
	: : : :

Measurement Level	Result
Δ (dB)	
> 20	PASS

Figure Channel 00:

Keysight 5	Spectrum Analyzer - Swept SA					0 7 8
Center I	RF 50 Ω AC Freg 2.39700000	0 GHz	SENSE:INT	ALIGN AUTO Avg Type: Log-Pwr	03:28:33 PM Sep 25, 2018 TRACE 1 2 3 4 5 6	Frequency
	Ref Offset 0.5 dB	PNO: Fast IFGain:Low	Trig: Free Run #Atten: 20 dB	Mkr3 2.3	398 820 70 GHz -48 97 dBm	Auto Tune
0.500					-1537 000	Center Freq 2.397000000 GHz
-29.5 -39.5 -49.5				◆ ³ ○ ²		Start Freq 2.390000000 GHz
-69.5 -69.5	an a	merhilink	Manufathatherman	Mar Marchand		Stop Freq 2.404000000 GHz
Start 2.3 #Res BV	390000 GHz V 100 kHz	#VBW	300 kHz	Sweep (#Swp) 2.6	top 2.404000 GHz 667 ms (40001 pts)	CF Step 1.400000 MHz Auto Man
1 N 2 N 3 N 4 5 6 7 8	1 f 2.402 1 f 2.400 1 f 2.398	170 55 GHz 000 00 GHz 820 70 GHz	6.03 dBm -53.17 dBm -48.97 dBm			Freq Offset 0 Hz
9 10 11 11				STATUS		

Figure Channel 78:

Keysight Sp	ectrum Analyzer -	-Swept SA					
Center F	req 2.489	0 12 AC	SENSE:II	Avg Type	ALIGN AUTO	03:42:43 PN Sep 25, 2018 TRACE 1 2 3 4 5 6 TYPE M WWWWW	Frequency
10 dB/div	Ref Offset Ref 10.5	t0.5 dB	#Atten: 20 dB	1	Vkr3 2.4	86 152 65 GHz -50.30 dBm	Auto Tune
0.500	Å					-14.68 dEm	Center Freq 2.489000000 GHz
-19.5	- h		♦ ³				Start Fred 2.478000000 GHz
-69.5 -69.5)	mulau Altu Vilda	ad Mandanad March	mustant	al Involute	and and the product of the second	Stop Free 2.500000000 GH
Start 2.4 #Res BW	7800 GHz 100 kHz	#	/BW 300 kHz	Sweep (#	(Swp) 2.6	Stop 2.50000 GHz 67 ms (40001 pts)	CF Step 2.200000 MH: Auto Mar
MKR MODE T	RC SCL	2 490 170 10 CHz	5 12 dBm	FUNCTION FUI	CTION WIDTH	FUNCTION VALUE	<u>rato</u> mai
2 N 3 N 4 5	f	2.483 500 00 GHz 2.486 152 65 GHz	-61.55 dBm -50.30 dBm				Freq Offse 0 Ha
6 7 8 9							
11			 "			*	
MEG					STATUS		



:	Portable Printer
:	Band Edge
:	No.3 OATS
:	2018/10/12
:	Mode 1: Transmit - $2Mbps(\pi/4DQPSK)$ (Hopping off)
	: : : :

Measurement Level	Result
Δ (dB)	
> 20	PASS

Figure Channel 00:

Keysight Spectrum Analyzer - Swe	ept SA				0 7 .
Center Freq 2 39700	AC 0000 GHz	SENSE:INT	ALIGN AUTO Avg Type: Log-Pwr	08:00:10 PM Oct 12, 2018 TRACE 1 2 3 4 5 6	Frequency
Borkor Froq 2.00100	PNO: Fast IFGain:Low	Trig: Free Run #Atten: 20 dB		DET P NNNN	
Ref Offset 0.6 10 dB/div Ref 10.50 d	idB IBm		Mkr3 2.3	99 999 85 GHz -54.31 dBm	Auto Tune
0.500				- Al	Center Fred
9.50				-16.74 dBm	2.397000000 GHz
-29.5	3 P 		A3 ~~~~	hong	Start Free 2.390000000 GHz
-43.5 -69.5 -69.5	opennen	مىلىدىلەيلىرىيە <mark>ر</mark> ىدىلەن بىيەلەردىد	ngton themesters and	<u> </u>	Stop Free 2.404000000 GH2
Start 2.390000 GHz #Res BW 100 kHz	#VBW	300 kHz	S Sweep (#Swp) 2.6	top 2.404000 GHz 67 ms (40001 pts)	CF Step 1.400000 MH: Auto Mar
MRR MODE TRC SCL 1 N 1 f 2 N 1 f	X 2.402 166 00 GHz 2.400 000 00 GHz	3.26 dBm -54.31 dBm	NCTION FUNCTION WIDTH	FUNCTION VALUE	
3 N 1 f 3	2.399 999 85 GHz	-54.31 dBm			0 Hz
6 7 8					
9 10 11					
MEG			STATUS		

Figure Channel 78:

Keysight Spe	ictrum Analyzer - 5	wept SA					07
Center F	RF 50 9	Ω AC 000000 GHz	SENSE:IN	Avg Typ	ALIGN AUTO	08:10:55 PM Oct 12, 2018 TRACE 1 2 3 4 5 6 TYPE M WWWWW	Frequency
10 dB/div	Ref Offset (Ref 10.50	J.6 dB J dBm	w #Atten: 20 dB		Mkr3 2.4	0ET P NNNNN 183 816 80 GHz -62.00 dBm	Auto Tune
Log 0.500 .9.50						-17 63 dam	Center Freq 2.489000000 GHz
-29.5 -39.5	- time						Start Freq 2.478000000 GHz
69.5 -69.5		we work have been and the	Halangan and the second	marchinetholeterson	واستاه مراجعه	drudumenter and a state of the second state of the second state of the second state of the second state of the	Stop Free 2.500000000 GH
Start 2.47 #Res BW	800 GHz 100 kHz	#	VBW 300 kHz	Sweep (#	#Swp) 2.6	Stop 2.50000 GHz 567 ms (40001 pts)	CF Ster 2.200000 MH
MKR MODE TR	IC SCL	×	()/	FUNCTION	NCTION WIDTH		Auto
1 N 1 2 N 1 3 N 1 4 5	f f f	2.480 015 20 GHz 2.483 500 00 GHz 2.483 816 80 GHz	2.37 dBm -64.15 dBm -62.00 dBm				Freq Offse
6 7 8 9							
11			1				
	_				CTATU		



Product	:	Portable Printer
Test Item	:	Band Edge
Test Site	:	No.3 OATS
Test date	:	2018/09/25
Test Mode	:	Mode 2: Transmit - 3Mbps (8DPSK) (Hopping off)

Measurement Level	Result
Δ (dB)	
> 20	PASS

Figure Channel 00:

Keysig	ht Spec	trum A	nalyzer - Sv	vept SA									0 7 3
Conto	r Er	RF	50 5	AC AC	CHa		SE	NSE:INT	Avo T	ALIGN AUTO	03:54:4	PM Sep 25, 2018	Frequency
Cente	r Fr	Freq 2.39/00000 GHZ PNO: Fast File Fast File File File File File File File File					Trig: Fre #Atten: 1	Trig: Free Run #Atten: 20 dB				DET P NNNN	
10 dB/d	fiv	Ref	Offset 0. 10.50	6 dB dBm						Mkr3 2	.399 58	6 50 GHz 8.45 dBm	Auto Tune
0.500											1 de la	1	Center Freq 2.397000000 GHz
-19.5 -29.5 -39.5 -49.5										♦ ³ ⊖ ² /~	M	hang	Start Freq 2.390000000 GHz
-69.5	ntermi	hulles	mongelah	winarty	milling	الحرب <i>ال</i> لويطانة ا	handradar	handlim	للمردومهماريس	alata tin		1.	Stop Freq 2.404000000 GHz
Start 2 #Res I	2.390 BW	0000 100	GHz (Hz	×		#VBW	/ 300 kHz	2	Sweep	(#Swp) 2	Stop 2.4 2.667 ms	04000 GHz (40001 pts)	CF Step 1.400000 MHz Auto Man
1 N 2 N 3 N 4 5 6 7	1			2.402 10 2.400 00 2.399 55	68 80 G 00 00 G 86 50 G	Hz Hz Hz	2.92 d -54.39 d -48.45 d	Bm Bm Bm					Freq Offset 0 Hz
8 9 10 11												-	
MEG										STAT	rus		

Figure Channel 78:

Keysight Spe	tctrum Analyzer -	Swept SA						0 7 📷
Center Fr	req 2.489	0000000 GH	Z	SENSE:IN	Avg '	ALIGN AUTO	04:07:36 PN Sep 25, 20 TRACE 1 2 3 4 / TYPE M WWW	Frequency
10 dB/div	Ref Offset Ref 10.5	166 20.5 dB 20 dBm	ain:Low	#Atten: 20 dB		Mkr3 2.4	485 469 00 GH -59.23 dB	Auto Tune
Log 0.500 .9.50							-17.95 d	Center Freq 2.489000000 GHz
-29.5	kon							Start Freq 2.478000000 GHz
69.5 -69.5 -79.5		What was a	consultanation	man and an and an and an and an	Same and the second second	and and a second	an an ann an	2.50000000 GH
Start 2.47 #Res BW	800 GHz 100 kHz		#VB\	N 300 kHz	Swee	p (#Swp) 2.	Stop 2.50000 GH 667 ms (40001 pt	Iz CF Ster (s) 2.20000 MH
MKR MODE TR	IC SCL	×	_		FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	
1 N 1 2 N 1 3 N 1 4	f f	2.480 174 70 2.483 500 00 2.485 469 00	GHz GHz GHz	2.05 dBm -64.59 dBm -59.23 dBm				Freq Offse
5 6 7 8								
9 10 11	<u>+</u>		=					
MSG						STATU	s	



:	Portable Printer
:	Band Edge
:	No.3 OATS
:	2018/09/25
:	Mode 1: Transmit - 1Mbps (GFSK)(Hopping on)
	: : : :

Measurement Level	Result
Δ (dB)	
> 20	PASS

Figure Channel 00 Hopping:

Keysight Spectrum Analyzer - Swept SA				0 7 0
04 RL № 50 Ω AC Center Freq 2.397000000	GHz Trig: Eree But	ALIGN AUTO	03:32:12 PN Sep 25, 2018 TRACE 1 2 3 4 5 6	Frequency
Ref Offset 0.5 dB 10 dB/div Ref 10.50 dBm	PNO: Fast D Ting. Free Run IFGain:Low #Atten: 20 dB	Mkr3 2.39	3 160 15 GHz -41.98 dBm	Auto Tune
9.50		1	14.07dSm	Center Freq 2.397000000 GHz
-295 -395 -495	AAAA			Start Freq 2.390000000 GHz
-695 -695 -795				Stop Freq 2.404000000 GHz
Start 2.390000 GHz #Res BW 100 kHz	#VBW 300 kHz	Sto Sweep (#Swp) 2.66	p 2.404000 GHz 7 ms (40001 pts)	CF Step 1.400000 MHz Auto Man
N 1 f 2.4019 2 N 1 f 2.4019 3 N 1 f 2.4019 5	80 50 GHz 5.33 dBm 00 00 GHz 43.26 dBm 60 15 GHz 41.98 dBm			Freq Offset 0 Hz
9 10 11 +	m	STATUS		

Figure Channel 78 Hopping:

Keysight :	Spectrum A	nalyzer - Swe	pt SA								0 7 2
Center	RF Freq 2	.48900	0000 GH	iz		Run	Avg Ty	ALIGN AUTO pe: Log-Pwr	03:45:27 P TNA TN	M Sep 25, 2018	Frequency
10 dB/div	Ref (Offset 0.5 10.50 d	dB IBm	NO: Fast 1 Gain:Low	#Atten: 2	0 dB		Mkr3 2.4	486 015 -42.	15 GHz 74 dBm	Auto Tune
0.500 9.500	M									-15.08 dƏm	Center Freq 2.489000000 GHz
-29.5	2	N N	A.51	A A	3	A.		144	AA	AAI	Start Freq 2.478000000 GHz
-59.5 -69.5 -79.5			<u> </u>	/ V	VVV	VV	VV	VV	V V V		Stop Freq 2.50000000 GHz
Start 2.4 #Res B\	17800 C	GHz (Hz		#VB	W 300 kHz	;	Sweep	(#Swp) 2.	Stop 2.5 667 ms (4	0000 GHz 0001 pts)	CF Step 2.200000 MHz
MKR MODE	TRC SCL		х		Y		NCTION F	UNCTION WIDTH	FUNCT	ON VALUE	Auto wan
1 N 2 N 3 N 4	1 f 1 f 1 f	2222	.478 000 0 .483 500 0 .486 015 1	0 GHz 0 GHz 5 GHz	4.92 de -58.93 de -42.74 de	3m 3m 3m					Freq Offset 0 Hz
6 7 8 9 10											
11				-	m	-					
MEG								STATU	s		



Product	:	Portable Printer
Test Item	:	Band Edge
Test Site	:	No.3 OATS
Test date	:	2018/10/12
Test Mode	:	Mode 1: Transmit - $2Mbps(\pi/4DQPSK)$ (Hopping on)

Measurement Level	Result
Δ (dB)	
> 20	PASS

Figure Channel 00 Hopping:

Keysight Spe	ectrum Analyz	er - Swept 5A							0 0 0
enter Fi	req 2.39	30 9 AC	IZ	Trig: Free Ru	Avg	Type: Log-Pwr	08:02:10 P TRA TY	MOct 12, 2018	Frequency
0 dB/div	Ref Offs Ref 10	set 0.5 dB 0.50 dBm	Sain:Low	#Atten: 20 dB		Mkr3 2.3	896 159 -44.	65 GHz 48 dBm	Auto Tune
og 500				0 0		-	CH NAME AND A DESCRIPTION OF THE PARTY OF TH	And All and	Center Free
19.5	_					-	1	-17.39 dBm	2.397000000 GH
19.5 19.5	in the survey	and a state of the	and the second	3	w.mar	and a start			Start Fre 2.390000000 GH
i9.5 i9.5 '9.5									Stop Fre 2.404000000 GH
tart 2.39 Res BW	0000 Gł 100 kHz	Hz 2	#VBV	V 300 kHz	Swee	ş p (#Swp) 2.0	Stop 2.40 367 ms (4	4000 GHz 10001 pts)	CF Ste 1.400000 MH
KE MODE TE	IC SCL	х		Y	FUNCTION	FUNCTION WIDTH	FUNCT	IOIN WALLIE	<u>-1010</u> Ind
1 N 1 2 N 1 3 N 1 4	f f f	2.401 996 23 2.400 000 00 2.396 159 63	5 GHz 5 GHz 5 GHz	2.61 dBm -47.68 dBm -44.48 dBm					Freq Offse 0 H
7 8 9									
	4 1			-			si		
G						STATUS			

Figure Channel 78 Hopping:

EL KI	eysight	Spect	rum A	nalyzer - Sw	wept SA											078
Cer	enter Freq 2.489000000 GHz						5	ENSE:INT	-	vg Typ	ALIGN AUT e: Log-Pv	00 08 Vr	13:02 PM TRACE	Oct 12, 2018	Frequency	
10.			Ref	Offset 0	5 dB	PNO IFGai	:Fast G in:Low	#Atten:	20 dB			Mkr3 2	2.485	DE 162	10 GHz	Auto Tune
10 o Log 0.500 .9.60 -19.5		(JT Marco	Men of	10.30										-40.0	.17.85 dBm	Center Fred 2.489000000 GHz
-29.5 -39.5 -49.5	; ; ;			- Mag	Aprel i	2	♦ ³	and the second	attenant	manthar	11 × 101	-	Arnellina	11 tave	Acon with your	Start Free 2.478000000 GH
69.5 69.5 79.5	5		-			_					.897.			V 49		Stop Fre 2.50000000 GH
sta ∕R€	rt 2.4 25 Bi	478 W 1	00 0	3Hz (Hz			#VB\	N 300 kH	z	Sw	veep (#	#Swp)	Sto 2.667 i	p 2.50 ms (4(000 GHz)001 pts)	CF Ste 2.200000 MH Auto Ma
KE	MODE	TRC	SCL		X		-	Y		FUNCTION	N FU	NCTION WIE	TH	FUNCTIO	N VALUE	
1 2 3 4	N N N	1	1 1 1		2.479 0 2.483 5 2.485 1	15 30 (00 00 (62 10 (3Hz GHz GHz	2.35 -51.38 -46.09	dBm dBm dBm				6		\equiv	Freq Offse
567																
9 10 11				_	_	_			_							
4 Lin			_					m			100	sta	mus		- •	



Product	:	Portable Printer
Test Item	:	Band Edge
Test Site	:	No.3 OATS
Test date	:	2018/09/25
Test Mode	:	Mode 2: Transmit - 3Mbps (8DPSK) (Hopping on)

Measurement Level	Result
Δ (dB)	
> 20	PASS

Figure Channel 00 Hopping:

Keysight S	ectrum Analys	ter - Swept SA					- P -
Center F	req 2.3	97000000 GHz	SENSE: IN	Avg Tyj	ALIGN AUTO be: Log-Pwr	03:57:14 PM Sep 25, 2018 TRACE 1 2 3 4 5 TYPE MWWWW	Frequency
10 dB/div	Ref Offs Ref 10	IFGain:Low set 0.5 dB	#Atten: 20 dB		Mkr3 2.3	96 173 30 GHz -44.61 dBm	Auto Tune
.9.50				-		Powersky because of the set	Center Fred 2.397000000 GH:
-19.5 -29.5 -39.5			♦3		02 mil	/ -17.27 dBn	Start Free 2.390000000 GH:
49.5	nditte gange	Harry Minger and Street	ant water manufacture	2000 de la construir de la cons La construir de la construir de	Children		Stop Fre 2.404000000 GH
Start 2.3 Res BW	90000 GI / 100 kHz	Hz z #V	BW 300 kHz	Sweep (S Swp) 2.6	top 2.404000 GHz 67 ms (40001 pts	CF Ste
	RC SCL	X 404 000 00 CH-	2.72 dBm	FUNCTION	UNCTION WIDTH	FUNCTION VALUE	Auto Ma
2 N 3 N 4 5		2.400 000 00 GHz 2.400 000 00 GHz 2.396 173 30 GHz	-49.46 dBm -44.61 dBm			,	Freq Offse 0 H
6 7 8 9							
	++-		-				÷.
ISG					STATUS		

Figure Channel 78 Hopping:

Keysight 5	pectrum An	ilyzer - Swep	t SA								
RL Center I	RF	50 12 4 8 9 0 0 0	AC DOOL GH	17	SENSI	SENSE:INT ALIGN AUTO Avg Type: Log-Pwr			0 04:09:48	ACE 1 2 3 4 5 6	Frequency
Genter	Tey Zi	403000	PI	40: Fast G Gain:Low	Trig: Free F #Atten: 20	Trig: Free Run #Atten: 20 dB			DET P NNNNN	A	
10 dB/div	Ref O Ref	ffset 0.5 10.50 di	dB Bm					Mkr3 2	2.490 16	8 20 GHz 6.72 dBm	Auto Tune
0.500	(p1										Center Free
-19.5				-						-18.42 dBm	2.4050000000111
-29.5 -39.5		Well	A2	2		3					Start Fred 2.478000000 GH;
49 5 69 5 69 5		Mary	itter for a finner	allestand	and a straight	VALUN	and a start of the	With South Miles	numbran	hip and a second second	Stop Free 2.500000000 GH
f9.5 Start 2.4 #Res BV	7800 G V 100 k	Hz Hz		#VBV	V 300 kHz		Sweep	(#Swp)	Stop 2. 2.667 ms	50000 GHz (40001 pts)	CF Ster 2.200000 MH Auto Ma
IKE MODE	TRC SCL		X		Y SO HD	FUN	CTION	UNCTION WID	THEFUNC	TION VALUE	2 (((((((((((((((((((
1 N 2 N 3 N	1 f	2.	480 165 9 483 500 0 490 168 2) GHz) GHz 0 GHz	-53.62 dBr -46.72 dBr	n n n			-		Freq Offse
4 5 6						+			6		он
8 9 10				_						<u> </u>	
11						1					
/56								STA	TUS		



7. Channel Number

7.1. Test Setup



7.2. Limit

Frequency hopping systems operating in the 2400-2483.5 MHz bands shall use at least 15 hopping frequencies.

7.3. Test Procedure

The EUT was setup to ANSI C63.4, 2014; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

7.4. Uncertainty

N/A



7.5. Test Result of Channel Number

Product	:	Portable Printer
Test Item	:	Channel Number
Test Site	:	No.3 OATS
Test date	:	2018/09/25
Test Mode	:	Mode 1: Transmit - 1Mbps (GFSK)

Frequency Range	Measurement	Required Limit	Result		
(MHz)	(Hopping Channel)	(Hopping Channel)	Result		
2402 ~ 2480	79	>15	Pass		

2402-2421MHz

2422-2441MHz

Reysign Spectrum Analyter - Seren SA			ga. Neysigin Spectrum Analyzer - Swept 34	0
Center Freq 2.411000000 GHz	Aug Type: Log-Pwr TMARE 12.2.4.5.6 Type: Log-Pwr TMARE 12.2.4.5.6	Frequency	Center Freq 2.431500000 GHz Tele Free Pine Aug Type: Log-Pwr THACE 12.245.6	Frequency
PRO: Fest up to the second sec	Mkr2 2.421 000 GHz 5.65 dBm	Auto Tune	Production Arten: 20 dB SciP mining Production Arten: 20 dB Mkr2 2.441 00 GHz 10 dBM/r Ref 00%set 05 dB 4.97 dBm	Auto Tune
	MMMM	Center Freq 2.411000000 GHz		Center Fred 2.431500000 GHz
-355 		Start Freq 2.400500000 GHz	205 205 405	Start Fred 2.421500000 GH:
69.5 69.5 79.5		Stop Freq 2.421500000 GHz	895 895 735	Stop Fred 2.441500000 GH:
Start 2.40050 GHz #Res BW 100 kHz #VBW 100 kHz	Stop 2.42150 GHz Sweep (#Swp) 2.533 ms (1001 pts)	CF Step 2.100000 MHz Auto Man	Start 2.42150 GHz Stop 2.44150 GHz RRes BW 100 kHz #VBW 100 kHz Sweep (#Swp) 2.467 ms (1001 pts)	CF Step 2.000000 MH: auto Mar
A 1 F 2462 000 GHz 5.56 dBm A 1 F 2462 000 GHz 5.85 dBm A 1 F 2421 000 GHz 5.85 dBm A 4		Freq Offset 0 Hz	N 1 f 2.422 00 GHz 5.25 dBm 3 1 1 1 f 2.441 00 GHz 4.97 dBm 3 4 6 6 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Freq Offse
9			9 9 9 10 11 11 11 11 11 11 11 11 11	
aso and a second se	ETATUS	1		

2442-2461MHz

2462-2480MHz

Center Freq 2.451500000 GHz PRO	Fast Carter 20 dB	Aug Type: Log-Pwr	02-48-34 PN Sep 25, 2018 TRACE 1 2 3 4 5 6 TVPT N WWWWWW DET P N M N N N	Frequency	Center Fro	eq 2.4715	00000 GHz PNC: Fast	Trig: Free Ru	M Avg Tyl n	ALIPH AUTO pe: Log-Pwr	02:49:14 PM Sep 25, 2018 TRACE 1 2 3 4 5 6 TVPE N WWWWWW	Frequency
Ref Offset 0.5 dB 10 dB/div Ref 10.50 dBm		Mkr2	2.461 00 GHz 4.93 dBm	Auto Tune	10 dB/div	Ref Offset 0 Ref 10.50	5 dB dBm			Mkr	2 2.480 00 GHz 4.58 dBm	Auto Tune
	WWW	WWW	VVV	Center Freq 2.461600000 GHz		W	VVVV	WW	vvv	W		Center Freq 2.471600000 GHz
-28.5 				Start Freq 2.441500000 GHz	-29.5						1	Start Freq 2.461500000 GHz
-10.5				Stop Freq 2.461500000 GHz	-09.5 -09.5 -70.5							Stop Freq 2.481600000 GHz
Start 2.44150 GHz #Res BW 100 kHz	#VBW 100 kHz	St Sweep (#Swp) 2.40	op 2.46150 GHz 37 ms (1001 pts)	CF Step 2.000000 MHz	Start 2.461 #Res BW 1	50 GHz 100 kHz	#VE	W 100 kHz	Sweep	(#Swp) 2	Stop 2.48150 GHz .467 ms (1001 pts)	CF Step 2.000000 MHz
1 N 1 [2.442.00 G	Hz 5.06 dBm	ACTON FURTHERNMOTH	FUNCTIONADUE	CMTO INIET		1	2.462 00 GHz	5.32 dBm	MARTON 1	UNCERTION AND ADDRESS OF	EUXHIONAAUG	CMIQ IMEN
2 N 1 T 2.461 00 G 3 4 5	Hz 4.93 dBm			Freq Offset 0 Hz	2 N 1 3 4 5		2,490 00 GHz	4.58 dBm				Freq Offset 0 Hz
6 7 8 9					6 7 8 9							
10					10			м				
weg		STATUE			Dew					STATUS		



Product	:	Portable Printer
Test Item	:	Channel Number
Test Site	:	No.3 OATS
Test date	:	2018/10/13
Test Mode	:	Mode 1: Transmit - $2Mbps(\pi/4DQPSK)$

Frequency Range	Measurement	Required Limit	Popult		
(MHz)	(Hopping Channel)	(Hopping Channel)	Kesuit		
2402 ~ 2480	79	>15	Pass		

2402-2421MHz

2422-2441MHz

M H
Ref Offset 05 dB Mkr2 2.421 000 GHz Mkr2 2.421 000 GHz Mkr2 2.421 000 GHz Auto Ture Ref Offset 05 dB Mkr2 2.441 00 GHz Auto Ture 0 dBd/w
0.1 0
Start Freq Start F
925 Stop Freq 925 Stop Freq 925 926
Start 2.40050 GHz Stop 2.42150 GHz CF Stop 2.42150 GHz Stop 2.42150
Auto Man Auto M
Image: Log Laboration Image: Log Laboration

2442-2461MHz

2462-2480MHz

BE Keysight Spectrum Analyzer - 3	wept 54					0 0 00	BE Keysiger Spect	nam Analyzatini	Swept SA								
Center Freq 2.4515	000000 GHz	SENS	19.1MT)	Avg Type: Log-Pwr	00:10:17 PHOct 12, 20 TRACE 1 2 3 4	Frequency	Center Fre	q 2.471	500000 GHz		SEN:	SELIVITI	Avg Type:	Log-Pwr	00:17:34 PM	1 2 3 4 5 6	Frequency
	PNO: Fast C IFGala:Low	#Atten: 20	dB dB		DET P N N N	Auto Tumo		с. 	PNC IFGa	in:Low	#Atten: 20	dB			DET	PRINT	Auto Tuno
Ref Offset 0	dBm			Mkr	2 2.461 00 GH 2.80 dB	n Auto Tune	10 dB/div	Ref Offset	0.5 dB)dBm					Mkra	-0.0	0 GHz 9 dBm	Auto Tune
Log 0.600	a attacollago hayan	to Macrosoft	an and the second second	weet and the second	and the second	Center Freq 2.461600000 GHz	4.60	and	International States	Majoria	يالاتي ستم	and the second	de ser	-mm.	all and a second	2	Center Freq 2.471600000 GHz
-29.5						Start Freq 2.441500000 GHz	-29.5 -29.5										Start Freq 2.461500000 GHz
49.5 -70.5						Stop Freq 2.461500000 GHz	-09.5 -09.5 -79.5										Stop Freq 2.481500000 GHz
Start 2.44150 GHz #Res BW 100 kHz	#VB	W 100 kHz	s	weep (#Swp) 2	Stop 2.46150 Gl .467 ms (1001 pt	iz CF Step 2.000000 MHz Auto Man	Start 2.461 #Res BW 1	50 GHz 00 kHz		#VBW	100 kHz		Sweep (#	\$wp) 2.	Stop 2.48 467 ms (1	150 GHz 001 pts)	CF Step 2.000000 MHz Auto Man
1 N 1 f 2 N 1 f 3 4	2.442 00 GHz 2.461 00 GHz	0.52 dBr 2.80 dBr	m m		FUNCTION VALUE	Freq Offset	1 N 1 2 N 1 3 4	1 1	2,452,00 2,480,00	GHz GHz	0.17 dB -0.09 dB	im Im		TION MOTO	RUSSEDD	WALKE -	Freq Offset
5 6 7 8 9 10 11		H				e	5 6 7 8 9 10 11				м						<u></u>



Product	:	Portable Printer
Test Item	:	Channel Number
Test Site	:	No.3 OATS
Test date	:	2018/09/25
Test Mode	:	Mode 2: Transmit - 3Mbps (8DPSK)

Frequency Range	Measurement	Required Limit	Recult		
(MHz)	(Hopping Channel)	(Hopping Channel)	Kesun		
2402 ~ 2480	79	>15	Pass		

2402-2421MHz

2422-2441MHz

📕 Keysigen Spachtum Analyzer - Sarepe SA		0	BR Naysigen Spectrum Analyzar	- Sarept SA				
And RF SOD AC SERVERT AUGUATO	04:11:33 04:5cp 25, 2018 TMACE 1 2 3 4 5 6 TVFE M warrante	Frequency	Center Freq 2.43*	1500000 GHz	Trig: Free Run	Aug Type: Log-Pwr	04:12:21 PM Sep 25, 2018 TMADE 1 2 3 4 5 6 TVPE M WWWWW	Frequency
Ref Offset 0.5 dB Mkr2 10 dB/div Ref 10.50 dBm	2.421 000 GHz 2.54 dBm	Auto Tune	Ref Offse 10 dB/div Ref 10.3	t0.5 dB	#Atten: 20 dB	Mkr	2 2.441 00 GHz 1.55 dBm	Auto Tune
	er dun dur ann fi	Center Freq 411000000 GHz	.e.so	adaya ya aya a	and the second second	and the second	in gebrugeling, blir gge 5	Center Freq 2.431600000 GHz
2925	2	Start Freq 2.400500000 GHz	-25.5					Start Freq 2.421500000 GHz
995	2	Stop Freq 2.421500000 GHz	-69.5 -69.5 -79.5					Stop Freq 2.441500000 GHz
Start 2.40050 GHz #Res BW 100 kHz #VBW 100 kHz Sweep (#Swp) 2	Stop 2.42150 GHz 533 ms (1001 pts)	CF Step 2.100000 MHz to Man	Start 2.42150 GHz #Res BW 100 kHz	#VB	W 100 kHz	Sweep (#Swp) 2	Stop 2.44150 GHz .467 ms (1001 pts)	CF Step 2.000000 MHz Auto Man
X Y Y TURETON TURETON		Freq Offset 0 Hz	1 N 1 f 2 N 1 f 3 4 6	2,422,00 GHz 2,441,00 GHz	1.38 dBm 1.55 dBm	UNCTON FUNCTION/071	PUNCTION 000 +	Freq Offset 0 Hz
9 7 8 9 10			0 7 8 9 10 11					
ri in		-	Mag			UTATU	1.1	

2442-2461MHz

2462-2480MHz

BE Keysight Spectrum Analyzer - Se	wept 54						. D. D	BE Ke	ysigm Spectry	m Analyzar al	Swept SA								
Center Freq 2.4515	000000 GHz	SENS	45:MU	Avg Type: Log-	-Pwr 10	# TN Sep 25, 2018 HACE 1 2 3 4 5 6	Frequency	Cen	ter Fred	2.471	500000 G	Hz	312	1985-1977)	Avg Typ	e: Log-Pwr	04:13:55 PM TRAC	5ep 25, 2018 5 1 2 3 4 5 6	Frequency
	PNO: Fast C IFGain:Low	Atten: 20	dB			DET P NTANTAN	Auto Tune			8	1	PNO: Fast 🕞 FGain:Low	#Atten: 2	o dB			DE	T P NILINA	Auto Tune
10 dB/div Ref Offset 0	dBm				Mkr2 2.46	1 00 GHz 0.79 dBm		10 cl	B/div F	ef Offset	0.5 dB 0 dBm					Mkr	2 2.480	00 GHz 02 dBm	
0.500	Angelow Hay She	and the factor	or the street of	and the second second	Sare Singer She	and the second second	Center Freq 2.451500000 GHz	0.500 -0.60	Alare.	a part was	allow freed	- and the second	- month	and the second	an and	and the same of	and the second	2	Center Freq 2.471500000 GHz
-38.5			-				Start Freq 2.441500000 GHz	-19.5 -29.5 -39.5 -49.5											Start Freq 2.461500000 GHz
-09.5 -09.5 -79.5					_		Stop Freq 2.461500000 GHz	-69.5 -69.5 -79.5											Stop Freq 2.481500000 GHz
Start 2.44150 GHz #Res BW 100 kHz	#VB	W 100 kHz		Sweep (#Sw	Stop 2. p) 2.467 m	.46150 GHz s (1001 pts)	CF Step 2.000000 MHz	Star #Re	1 2.4615 5 BW 10	0 GHZ 0 kHz		#VBV	V 100 kHz		Sweep	(#Swp) 2	Stop 2.48 .467 ms (*	150 GHz 1001 pts)	CF Step 2.000000 MHz
	2.442.00 GHz	1.91 dB	im Hunc	TON FUNCTION	MOTH FUN	- HORNARUE	CMTA IMBL	1	N 1	() [2.452	00 GHz	1.94 dE	6020 Bm	TON		HUNCHO	INVALUE -	
3 4 5	2.461 00 GHZ	0.79.015	m				Freq Offset 0 Hz	3 4 5			2,480	OU GHZ	-0.02 dt	sm.				e	Freq Offset 0 Hz
6 7 8 9								6 7 8 9											
			-					11	_	-						-			
Med				4	STATUE			Nec								STATUS	6		

8. Channel Separation

8.1. Test Setup



8.2. Limit

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

8.3. Test Procedure

The EUT was setup to ANSI C63.4, 2014; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

8.4. Uncertainty

 \pm 283Hz



8.5. Test Result of Channel Separation

Product	:	Portable Printer
Test Item	:	Channel Separation
Test Site	:	No.3 OATS
Test date	:	2018/09/25
Test Mode	:	Mode 1: Transmit - 1Mbps (GFSK)

	Encourantes	Measurement	Limit	Limit of (2/3)*20dB	
Channel No.	All-)	Level	(1-11-)	Dandaridth (hII-)	Result
	(MHZ)	(kHz)	(KHZ)	Bandwidth (KHZ)	
00	2402	1000	>25 kHz	662.0	Pass
39	2441	1000	>25 kHz	664.0	Pass
78	2480	1000	>25 kHz	664.0	Pass

NOTE: The 20dB Bandwidth is refer to section 10.

Channel 00 (2402MHz)

🊺 Ke	ysight	Spect	rum A	nalyzer - Swe	pt SA								
Cer	L Iter	Fre	RF eq 2	50 Ω 2.40200	AC	z	SEN	ISE:INT	Avg Ty	ALIGN AUTO	03:27:46 PI TRAC	H Sep 25, 2018	Frequency
			Ref	Offset 0.5	PN IFG	IO: Wide Gain:Low	#Atten: 20) dB		Mkr	2 2.403	00 GHz	Auto Tune
10 d	B/div	,	Ref	10.50 d	iBm			_			5.3	28 dBm	
Log 0.500 -9.50 -19.5									2				Center Freq 2.402000000 GHz
-29.5 -39.5 -49.5	Lulai		ntelian	www.Wh	nere the test of test	William				Mungulty	Mirman	Malandadara	Start Freq 2.397000000 GHz
-59.5 -69.5 -79.5			- 16a.	1 Indu or							<u>, ht 1, 1, 164</u>		Stop Freq 2.407000000 GHz
Cer #Re	ter s B	2.40 W 1	020 00	00 GHz kHz		#VB	W 100 kHz		-	#Sweep 5	Span 1 00.0 ms (0.00 MHz 1001 pts)	CF Step 1.000000 MHz Auto Map
MKR 1 2 3 4 5 6 7 8 9 10 11	MODE N N		SCL f		× 2.402 00 2.403 00	0 GHz 0 GHz	* 5.26 dE 5.28 dE	Bm Bm Bm		UNCTION WIDTH	FUNCTIO		Freq Offset 0 Hz
MSG										STATU	3		

🊺 Key	ysight Sp	ectrum	Analyzer - Sw	ept SA								
Cen	ter F	RF req	50 Ω 2.44100	AC 00000 GH	lz	SET	Run	Avg Typ	ALIGN AUTO e: Log-Pwr	03:36:28 P	M Sep 25, 2018 CE 1 2 3 4 5 6 PE M WWWWW	Frequency
10 di	B/div	Rei Re	f Offset 0.4	5 dB dBm	iO: Wide Gain:Low	#Atten: 2	0 dB		Mkr	2 2.442 5.	00 GHz 37 dBm	Auto Tune
Log 0.500 -9.50 -19.5								2				Center Freq 2.441000000 GHz
-29.5 -39.5 -49.5	-	Likur		w.referentering	wellet!/~~~				NºW-MALILIAN	and the second	WINNAMALAMAN	Start Freq 2.436000000 GHz
-59.5 -69.5 -79.5		11									, Iteact	Stop Freq 2.446000000 GHz
Cen #Re:	ter 2. s BW	4410 100	00 GHz kHz	×	#VE	3W 100 kHz	FUN	#	Sweep 5	Span 1 00.0 ms (0.00 MHz 1001 pts)	CF Step 1.000000 MHz <u>Auto</u> Man
1 2 3 4 5 6	N N	1 f 1 f		2.441 0 2.442 0	0 GHz 0 GHz	5.70 dl 5.37 dl	3m 3m				=======================================	Freq Offset 0 Hz
7 8 9 10 11 (m						
MSG									STATUS	5		

Channel 39 (2441MHz)

Channel 78 (2480MHz)





:	Portable Printer
:	Channel Separation
:	No.3 OATS
:	2018/10/13
:	Mode 1: Transmit - 2Mbps(π/4DQPSK)
	: : : :

	Encourance	Measurement	Limit	Limit of (2/3)*20dB	
Channel No.	(MHz)	Level	(1.11.7)	Dondwidth (1117)	Result
	(MHZ)	(kHz)	(KHZ)	Bandwidin (KHZ)	
00	2402	1000	>25 kHz	896.0	Pass
39	2441	1000	>25 kHz	898.0	Pass
78	2480	1000	>25 kHz	894.0	Pass

NOTE: The 20dB Bandwidth is refer to section 10.

🎉 Keysight Sp	ectrum Analyzer	- Swept SA								
KN RL Center F	RF 5 Freq 2.402	0 Ω AC 2000000 GH	Ηz	SEI	NSE:INT	Avg Type	ALIGN AUTO : Log-Pwr	07:59:41 PI TRAC	M Oct 12, 2018	Frequency
10 dB/div	Ref Offse Ref 10.5	0.5 dB	NO: Wide G Gain:Low	#Atten: 2	0 dB		Mkr	2 2.403 0.	00 GHz 54 dBm	Auto Tune
Log 0.500 -9.50 -19.5					1					Center Freq 2.402000000 GHz
-29.5 -39.5 -49.5										Start Freq 2.397000000 GHz
-59.5 -69.5 -79.5	en sharren en e	and an and a second second						Mahan Andrew Incides	iller stranger (Theodore	Stop Freq 2.407000000 GHz
Center 2 #Res BW	402000 G 100 kHz	Hz	#VB\	V 100 kHz		#:	Sweep 5	Span 1 00.0 ms (0.00 MHz 1001 pts)	CF Step 1.000000 MHz <u>Auto</u> Man
MKR MODE M 1 N 2 N 3 4 5 6 7 6 7 8 9 9 10 10	RC SCL 1 f 1 f	x 2.402 0 2.403 0	00 GHz 00 GHz	¥ 3.08 dl 0.54 dl	Bm Bm Bm		ICTION WIDTH	FUNCTIO		Freq Offset 0 Hz

Channel 00 (2402MHz)

🎉 Keysight Sp	ectrum Analyzer - Swe	pt SA						
KARL Center F	RF 50 Ω Freq 2.44100	AC 0000 GHz	SENSE:I	Avg Type	ALIGN AUTO : Log-Pwr	08:05:56 PM TRAC	E 1 2 3 4 5 6	Frequency
10 dB/div	Ref Offset 0.5 Ref 10.50 d	PNO: Wide IFGain:Low	#Atten: 20 dE	3	Mkr	2 2.442 3.(00 GHz 08 dBm	Auto Tune
Log 0.500 -9.50 -19.5				2				Center Freq 2.441000000 GHz
-29.5 -39.5 -49.5			~		krony hute	- Albaha		Start Freq 2.436000000 GHz
-59.5 -69.5 -79.5	hundred marked and a fail					And and a second se	hrindyshelpsonlervy	Stop Freq 2.446000000 GHz
Center 2. #Res BW	441000 GHz 100 kHz	#VE	BW 100 kHz	#	Sweep 5	Span 1 00.0 ms ('	0.00 MHz 1001 pts)	CF Step 1.000000 MHz <u>Auto</u> Man
1 N 2 N 3 4 5 6	1 f 1 f	2.441 00 GHz 2.442 00 GHz	3.07 dBm 3.08 dBm					Freq Offset 0 Hz
7 8 9 10 11 <								
MSG					STATUS			

Channel 39 (2441MHz)

Channel 78 (2480MHz)





Product	:	Portable Printer
Test Item	:	Channel Separation
Test Site	:	No.3 OATS
Test date	:	2018/09/25
Test Mode	:	Mode 2: Transmit - 3Mbps (8DPSK)

	Encourance	Measurement	Limit	Limit of (2/3)*20dB	
Channel No.	(MHz)	Level	(1,11,-)	Dondwidth (1117)	Result
	(MHZ)	(kHz)	(KHZ)	Bandwidin (KHZ)	
00	2402	1000	>25 kHz	880.0	Pass
39	2441	1000	>25 kHz	878.0	Pass
78	2480	1000	>25 kHz	880.0	Pass

NOTE: The 20dB Bandwidth is refer to section 10.

🊺 Keysight S	pectrum /	Analyzer - Swe	pt SA									
Center F	RF Freq 2	50 Ω 2.40200	AC 0000 GH	Iz	Tria: F	SENSE:INT	Avg	A Type:	LIGN AUTO	03:54:03 PM TRAC	E 1 2 3 4 5 (Frequency
10 dB/div	Ref Ref	Offset 0.5	dB iBm	IO: Wide Sain:Low	#Atten	20 dB			Mkr	2 2.403 2.	00 GHz	Auto Tune
Log 0.500 -9.50 -19.5							2 2					Center Freq 2.402000000 GHz
-29.5 -39.5 -49.5		an ta da c	A LA JULIAN	with the second								Start Freq 2.397000000 GHz
-59.5 -69.5 -79.5		<u>Alffred an </u>								in the second	chiring and a	Stop Freq 2.407000000 GHz
Center 2 #Res BW	2.4020 V 100	00 GHz kHz		#VE	3W 100 KI	Hz		#S	weep 5	Span 1 00.0 ms (0.00 MHz 1001 pts)	CF Step 1.000000 MHz Auto Man
MKR MODE 1 N 2 N 3 4 5 6 7 8 9 10 11	TRC SCL 1 f 1 f 		× 2.402 0 2.403 0	0 GHz 0 GHz	Y 2.63 2.74	dBm dBm	FUNCTION				DN VALUE	Freq Offset

Channel 00 (2402MHz)

🊺 Keysi	ight Spe	ctrum A	Analyzer - Swe	ept SA											
Cent	er Fr	_{RF} eq 2	50 Ω 2.44100	AC 0000 GH	z	Tri	SENSE:	INT	Avg Ty	ALIG	n auto g-Pwr	04:01:23 P	M Sep 25, 2018	6	Frequency
10 dB	/div	Ref Ref	Offset 0.5 10.50 d	dB IBm	IO: Wide Gain:Low	#A1	iten: 20 di	B			Mkr	2 2.442 0.	00 GHz 22 dBm		Auto Tune
Log - 0.500 - -9.50 - -19.5 -									2						Center Freq 2.441000000 GHz
-29.5 - -39.5 - -49.5 -			r dr. doarn	uil	W					hem	A H	M. J. Jack March	Nendaullus a s		Start Freq 2.436000000 GHz
-59.5 -69.5 - -79.5 -	, fylf f (skiljøl	<u>ritan</u>	ender Heit Julie										l kuu miiteel		Stop Freq 2.446000000 GHz
Cente #Res	er 2.4 BW	410 100	00 GHz kHz	~	#V	BW 100	kHz	ELIN		#Sw	eep 5	Span 1 00.0 ms (0.00 MHz 1001 pts)		CF Step 1.000000 MHz Auto Man
1 2 3 4 5	N 1 N 1	f		2.441 00 2.442 00	0 GHz 0 GHz	2	. <u>.68 dBm</u> I.22 dBm						=		Freq Offset 0 Hz
7 8 9 10 11														•	
MSG											STATUS				

Channel 39 (2441MHz)

Channel 78 (2480MHz)



9. Dwell Time

9.1. Test Setup



9.2. Limit

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

9.3. Test Procedure

The EUT was setup to ANSI C63.4, 2014; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

9.4. Uncertainty

 \pm 25msec



9.5. Test Result of Dwell Time

Product	:	Portable Printer
Test Item	:	Dwell Time
Test Site	:	No.3 OATS
Test date	:	2018/09/25
Test Mode	:	Mode 1: Transmit - 1Mbps (GFSK) (Channel 00,39,78 –DH5)

Frequency (MHz)	Time slot length (ms)	Hopping of Number	Sweep time (ms)	Duty cycle	Dwell Time (Sec)	Limit (Sec)	Result
2402	2.887	13	50	0.75	0.300	0.4	Pass
2441	2.887	13	50	0.75	0.300	0.4	Pass
2480	2.887	13	50	0.75	0.300	0.4	Pass

Duty cycle = ((Time slot length(ms)*Hopping of Number) / Sweep time (ms)

Dwell time = (Duty cycle /79) * (79*0.4)

Dwell time in AFH mode / 20 channels with hopping rate 800 hops /sec.

CH 00 Time Interval between hops

CH 00 Transmission Time

BR. Keysigen S	petto	im Analyis	ir - Sweepe S	Ab y			100			100						BR Keyti	ight Spect	hum An	allyter - Sheepe Si	4 510			1.00	776				
Center [Free	q 2.40	20000	00 GH	HZ NO: Fest	_	Trig: Vi	Jense in Ideo	<u>ei</u>	Avg Tyr	pe: Log-Pw) [03: #	32:45 PM SO TRACE 1 TYPE V	p 25, 2038 2 3 4 5 6	Frequency	Cente	er Fre	eq 2.	4020000	000 GH2	t Frank Ca	Trig: Vide	se:an1]	Avg Ty	pe: Log-Pw	0 0332.59 PK W 1MAS TVP	Scp 25, 2038 1 2 3 4 5 6 E WWWWWW	Frequency
10 dB/div	P	tef Offsi tef 20.	et 0.5 dE 50 dBi	iii I N	Gain:Lov		Atten: 3	30 dB	<u> </u>	_			DETH	NNANA	Auto Tune	10 dB/	/div	Ref 0	offset 0.5 dB 20.50 dBr	ı⊭Ga 3 m	inclow	Atten: 30	dB			Mkr3 6. 5.9	613 ms 99 dBm	Auto Tune
10.5										- 12/3					Center Freq 2.402000000 GHz	30.5 0.500				Ŷ	¢.			•				Center Freq 2.402000000 GHz
0 500 -9 50	+										_				Start Freq 2.402000000 GHz	-8.50 -19.5 -29.5											THE LYL	Start Freq 2.402000000 GHz
-19.5	+							_			_				Stop Freq 2.402000000 GHz	-49.5 -59.5 -69.5					napana			'n	Amud			Stop Fred 2.402000000 GH:
-38.5						Ħ		+			+	+			CF Step 1.000000 MHz Auto Man	Cente Res E	er 2.40 BW 1.0	0200 0 MH	0000 GHz Iz	2 X	#VBN	V 1.0 MHz	FUNCT	IDN 1	Sweep	S 10.00 ms (1	pan 0 Hz 1001 pts)	CF Step 1.000000 MH3 Auto Mar
-59.5	4	4		4	10		v			w	W		le .	×	Freq Offset 0 Hz	1 1	N 1 N 1 N 1	t t t		2.85 3.72 6.61	7 ms 6 ms 3 ms	5.95 dB 6.06 dB 6.99 dB	m m m				-	Freq Offset 0 Ha
Center 2	1.40	200000	00 GHz		#1		1.0.046	-			Swaan	50.00	Spr	an O Hz		7 8 9 10 11												
HOS DIV	1.0	MINE				Dir	LO MIL		—		Unecp	50.00	ina (io	or proj		M90		_							IT A	Tun		

CH39 Time Interval between hops

CH 39Transmission Time

	0 0	Keysight Spectrum Analyzer - Swep	ESA		0 0
AUDIN AUTO 00 20 23 PM Sep 25, 2010 Avg Type: Log-Pwr TRACE 1 2 3 4 5 6 TVPT WWWWWW	Frequency	Center Freq 2.441000	0000 GHz PMC East Trig: Video	Avg Type: Log-Pwr TF	PH Sep 25, 2018 Frequency Frequency
DET P REAM IN R	Auto Tune		IFGala:Low Atten: 30 dB	Milera	Auto Tune
		10 dB/div Ref 20.50 dB	dB Bm	WIKTS 6	5.02 dBm
	Center Freq	10.5	$\langle \rangle^1 \rangle^2$	♦3	Center Freq
	2.441000000 GHz	0.600			2.441000000 GHz
	Start Fred	-19.5			Start Erec
	2.441000000 GHz	-29.5			1801ML 2.441000000 GHz
		49.5	owtherman	Michar	
	2.441000000 GHz	69.6			2.441000000 GHz
mo.v.		64.5		8	
	1.000000 MHz	Res BW 1.0 MHz	#VBW 1.0 MHz	Sweep 10.00 ms	(1001 pts) 1.000000 MHz
V N N W V M	Page Inter	1 N 1 L	2.867 ms 5.96 dBm	UNCTON FUNCTION WORKING FUNC	
	Freq Offset	2 N 1 1 3 N 1 1	3.726 ms 6.07 dBm 6.613 ms 6.02 dBm		Freq Offset
	0 Hz	5			e 0 Hz
		8			
Span 0 Hz		10			
starte	aii	weg		STATUS	
	Avg Type: Log Pwr Avg Type: Log Pwr Hace [12:2:4:5; 12:4:5; 12:4:5;	Clority is an example Frequency Avg Type: Log Pwr 12.24.55 (2017) Frequency Auto Tune 2.441000000 GHz Auto Tune Center Freq 2.441000000 GHz Start Freq 2.441000000 GHz Start Freq 2.441000000 GHz Image: Start Freq 2.441000000 GHz Image: Start Freq 2.441000000 GHz Start Freq 2.441000000 GHz Image: Start Freq 2.441000000 GHz Image: Start Freq 2.44100000 GHz Image: Start Freq 2.441000000 GHz Image: Start Freq 2.441000000 GHz Image: Start Freq 2.44100000 GHz Image: Start Freq 2.44100000 GHz Image: Start Freq 2.441000000 GHz Image: Start Freq 2.44100000 GHz Image: Start Freq 2.44100000 GHz Image: Start Freq 2.441000000 GHz Image: Start Freq 2.44100000 GHz Image: Start Freq 2.44100000 GHz Image: Start Freq 2.44100000 GHz Image: Start Freq 2.44100000 GHz Image: Start Freq 2.44100000 GHz Image: Start Freq 2.44100000 GHz Image: Start Freq 2.44100000 GHz Image: Start Freq 2.44100000 GHz Image: Start Freq 3.550 Freq 3	Control Bit State 25, 365 Frequency Mage: pattern Adaptation State Avg Type: Log-Pwr Rescale 23, 24, 56 Frequency Rescale 23, 24, 56 Center Freq 2.441000 Avg Type: Log-Pwr Rescale 23, 24, 56 Frequency Rescale 23, 24, 56 Rescale 23, 24, 56 Avg Type: Log-Pwr Rescale 23, 24, 56 Frequency Auto Tune Rescale 24, 41000 Auto Tune Rescale 24, 4100, 400, 400, 400, 400, 400, 400, 4	Start Pre- avg Type: Log-Pwr Bit Start Start Start Pre- top Pre- start Pre- Pre- start Pre- start Pre- start Pre- start Pre-	Light All 0 Bit Registry Mark Bit Registry Mark Bit Registry Mark Display Mark <th< td=""></th<>



CH 78 Time Interval between hops

CH 78 Transmission Time

Mill Image: Proj 100 //C Ima	ittern Analyse - Swept Sk	🗱 Neysight Spectrum Analytic - Swept SA		A DESCRIPTION OF A DESC				pter - Sheepe SA	pettram Analyter -	BR Reysign
Image: Solution Autor Solution Mixer Solution Autor	RF SetSet2011 ALIGN ACTO G234428 PM Sq2 25,2018 Frequency %Q 2.480000000 GHz Trig: Video Avg Type: Log-Pwr Trig: Video Frequency	Center Freq 2.480000000 GHz Aug Video Avg Type: Log-Pw	Frequency	03:16:05 PH Scp 25, 2018 TRACE 1 2 3 4 5 6	Avg Type: Log-Pwr	SERSE INT	GHz	80000000 G	Freq 2.4800	Center
Ref Offset D5 d6l Mkr3 6.613 ms Mkr3 6.613 ms 10 d8/dw Ref 20.50 dBm 10 dB/dw Ref 20.50 dBm 5.31 dBm 10 d8/dw Ref 20.50 dBm 01 02 3 0 2.48000000 dHz 2.480000000 dHz 2.480000000 dHz	PND: Feat () Hy Halls Det PNN han Atten: 30 dB Det PNN han Atten Turne	BFGainLow Atten: 30 dB	Auto Tupe	DETPRNNNN		Atten: 30 dB	IFGain:Low	्राह	52	
Lug Lug 1 22 3 Center 060 248000000 GHz 900 0 0 0 0 24800000 24800000 0 <td>Ref 0f5et 05 dB Mkr3 6.613 ms 5.31 dBm</td> <td>Ref Offset 0.5 dB 10 dB/div Ref 20.50 dBm</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>set 0.5 dB 0.50 dBm</td> <td>Ref Offset 0 Ref 20.50</td> <td>10 dB/div</td>	Ref 0f5et 05 dB Mkr3 6.613 ms 5.31 dBm	Ref Offset 0.5 dB 10 dB/div Ref 20.50 dBm						set 0.5 dB 0.50 dBm	Ref Offset 0 Ref 20.50	10 dB/div
	Center Freq 2.4500000 GHz		Center Freq 2.48000000 GHz							10.6
Start Freq 100 Start	Start Freq 2.49000000 GHz	80	Start Freq 2.49000000 GHz							-9.50
105 30 30 30 30 30 30 30 30 30 30 30 30 30		205 (http://www.second	Stop Freq 2.48000000 GHz							-19.5
035 CF Step Center 2.480000000 GHz Span 0 Hz Span 0 Hz Span 0 Hz 1000000 MHz Res BW 1.0 MHz #VBW 1.0 MHz Sweep 10.00 ms (1001 pts) Auto	180000000 GHz Span 0 Hz CFStep .0 MHz ≢vBw 1.0 MHz Sweep 10.00 ms(1001 pts) 	Center 2.480000000 GHz Res BW 1.0 MHz #VBW 1.0 MHz Sweep	CF Step 1.000000 MHz Suto Man	mplyr						-39.5
40.5 w b c W L 2.267 ms 5.21 dBm model model Freq O 53.5 -	1 2.467 ms 5.11 dBm FloreFold FloreFol	Inc LOG (body met 6c) X Y Tracelog Tracelog <thtracelog< th=""> <thtracelog< th=""> Tracelo</thtracelog<></thtracelog<>	Freq Offset 0 Hz		• • • • •		he he	/ v h	WW	-49.5
40.5 6		6		Span 0 Hz				000 GHz	.480000000	-69.5 Center
Res BW 1.0 MHz #VBW 1.0 MHz Sweep 50.00 ms (1001 pts)				00 ms (1001 pts)	Sweep 50.	1.0 MHz	#VBW 1		1.0 MHz	Res BW

Note:

The dwell times of the packet type of DH1, DH3, and DH5 are tested. Only the worst case is shown on the report.



table Printer
ell Time
3 OATS
8/10/13
de 1: Transmit - 2Mbps(π/4DQPSK)(Channel 00,39,78 –2DH5)

Frequency (MHz)	Time slot length (ms)	Hopping of Number	Sweep time (ms)	Duty cycle	Dwell Time (Sec)	Limit (Sec)	Result
2402	2.887	13	50	0.75	0.300	0.4	Pass
2441	2.887	13	50	0.75	0.300	0.4	Pass
2480	2.887	13	50	0.75	0.300	0.4	Pass

Duty cycle = ((Time slot length(ms)*Hopping of Number) / Sweep time (ms)

Dwell time = (Duty cycle /79) * (79*0.4)

Dwell time in AFH mode / 20 channels with hopping rate 800 hops /sec.

CH 00 Time Interval between hops

CH 00 Transmission Time

🗊 Keyaight Sportsum Analyzar - Sortpr St.	0 2 10	🕼 Keyagit Spectrum Analyzin - Songe SA
RL III Deg. Ac Sense: WIT Auton atto Geocode Who dia 2 2014 Center Freq 2.402000000 GHz Trace Video Avg Type: Log-Pwr Trace [123 45 Trace [123 45	6 Frequency	Center Freq 2.402000000 GHz Trig: Video Trig: Video Trig: Video
Ref Offset 0.5 dB No active Atten: 30 dB perior Atten: 10 article - Ref 20.50 dBm	Auto Tune	Bet 0 50 fb m Atten: 30 dB Set 0 fb m Auto Tune No static Ref 0 fb m 4.13 0 dBm Auto Tune
	Center Freq 2.402000000 GHz	100 101 100 101 102 102 102 102
	Start Freq 2.402000000 GHz	280 195
.195	Stop Freq 2.402000000 GHz	455
395	CF Step 1.000000 MHz Auto Man	Center 2.402000000 GHz Span 0 Hz Span 0 Hz Res BW 1.0 MHz #VBW 1.0 MHz Sweep 10.00 ms (1001 pts) 1000000 MHz Auto Man
	Freq Offset 0 Hz	1 N 1 t 2.067 ms 4.06 dBm 2 N 1 t 3.726 ms 3.44 dBm 3 N 1 t 6.613 ms 4.30 dBm 4 5 - - - -
©25 Center 2.402000000 GHz Span 0 H	z	0
кез вих 1.0 мнz #VBW 1.0 мнZ Sweep 50.00 ms (1001 pts ию вталов	9 	NG STATUS

CH39 Time Interval between hops

CH 39Transmission Time

DE Neysign Sparthum Gestyne - Swept St		BR Keylüğe Spectrum Analyse - Soreje SA
RL RF Ison AC Sense and Sense and PBO Feet Auge across Geno 12 OH on (12, 20 across) Center Freq 2.441000000 GHz PBO Feet Trig: Video Avg Type: Log-Pwr Trig: Video Trig: Video	Frequency	Align at applied of the sense and a
PGantLow Attent 30 dB as p minute Ref Offset 0.5 dB 10 dB/dv Ref 20.50 dBm	Auto Tune	Ref Offset 05 dB Mkr3 6.613 ms Auto Tune p0 dB/div Ref 20.50 dBm 4.36 dBm Auto Tune
	Center Freq 2.441000000 GHz	Conter Freq 2.44100000 GHz
1900	Start Freq 2.441000000 GHz	195 195 205 more 200
-105	Stop Freq 2.441000000 GHz	885 Stop Freq 2.44100000 GHz
.85	CF Step 1.000000 MHz Auto Man	Center 2.441000000 GHz Span 0 Hz CF Step Res BW 1.0 MHz #VBW 1.0 MHz Sweep 10.00 ms (1001 pts) 1000000 MHz Auto Man
	Freq Offset 0 Hz	N L 2.857 ms 4.05 dBm 1.05 dBm 2 N I 3.728 ms 3.41 dBm Freq Offset N I 6.613 ms 4.36 dBm 0 Hz 0 Hz
R25 Span 0 H Center 2.44 1000000 GHz Sypan 0 H Boe BW 4 0 MHz Sypan 0 H	z	9 -
Also are to mine. The mine oweep 50.00 ms (100 pts	2	Mag UTATUS


CH 78 Time Interval between hops

CH 78 Transmission Time

Bill Keysuget Sporthum Analytist - Swept SA	No. O	Ban Rejurget Spectrum Analyzer - Sweet SA
Center Freq 2.480000000 GHz Trig Mileo Aug Type: Log-Pwr THAGE	12 2 3 4 5 6 Frequency	Center Freq 2.480000000 GHz Avg Type: Log-Pwr Teace 12.345 6 Frequency
IFGain:Low Atten: 30 dB DET	Auto Ti	PND: sait right to dB but priminin
Ref Offset 0.5 dB 10 dB/div Ref 20.50 dBm	200	Ref Offset 05 dB Mkr3 6.613 ms
105	Center F 2.480000000	Fee 109 (GHz 2000 (GHz 2000
	Start F 2.480000000	
-85	110 Stop F	Stop Fr 00.6 30.6 2.48000000 G 00.5 2.48000000 G
30.5	CF S 1.0000001	Step Center 2.480000000 GHz Span 0 Hz CF st Mick Res BW 1.0 MHz #VBW 1.0 MHz Sweep 10.00 ms (1001 pts) And Company Sweep 10.00 ms (1001 pts)
185 bit	-1	Include Include X Y Postcol Function Function
-92.5	FreqOf	Ifset 2 N 1 t 3/76 ma 228 dbm Freq Offs 0 Hz 4 0 0 Hz 4 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
82.5		
Center 2.480000000 GHz Spa Res BW 1.0 MHz #VBW 1.0 MHz Sweep 50.00 ms (10)	n 0 Hz 01 pts)	
W6G STATUE		MSC STATUS

Note:

The dwell times of the packet type of DH1, DH3, and DH5 are tested. Only the worst case is shown on the report.



Product	:	Portable Printer
Test Item	:	Dwell Time
Test Site	:	No.3 OATS
Test date	:	2018/09/25
Test Mode	:	Mode 2: Transmit - 3Mbps (8DPSK) (Channel 00,39,78 –3DH5)

Frequency (MHz)	Time slot length (ms)	Hopping of Number	Sweep time (ms)	Duty cycle	Dwell Time (Sec)	Limit (Sec)	Result
2402	2.887	13	50	0.75	0.300	0.4	Pass
2441	2.887	13	50	0.75	0.300	0.4	Pass
2480	2.887	13	50	0.75	0.300	0.4	Pass

Duty cycle =((Time slot length(ms)*Hopping of Number) / Sweep time (ms)

Dwell time = (Duty cycle /79) * (79*0.4)

Dwell time in AFH mode / 20 channels with hopping rate 800 hops /sec.

B Keysigen	Spectr	nam Analyzar	Sheepe SA			14			11					BR Keysigin Spectrum Analyzer	- Surept SA		11 march	100000000000000000000000000000000000000	
Center	Fre	q 2.402	000000	GHz			SERSE IN	A	vg Type	Log-Pwr	103:57:1	ACE 1 2 3 4 5 4	Frequency	Center Freq 2.402	2000000 GHz	SERSE IN	Avg Type: Log-Pwr	10358 01 PM Scp 25, 2018 18408 1 2 3 4 5 6	Frequency
		52		PNO: I IFGain	Low	Atten:	30 dB					DETPNNNN		a 112	PND: Fest C+	Atten: 30 dB		DETPNNNNN	Auto Tuno
10 dB/div	1	Ref Offset Ref 20.5	0.5 dB 0 dBm										Auto Tune	10 dB/div Ref 20.5	t05 dB i0 dBm			Mkr3 6.613 ms 4.60 dBm	Auto Tuni
10.5													Center Freq 2.402000000 GHz	30.5 0.500					Center Fred 2.402000000 GHz
-9.50													Start Freq 2.402000000 GHz	-195				180.L/G.	Start Free 2.402000000 GHz
-19.5													Stop Freq 2.402000000 GHz	49.5 -59.5 -69.5	and the second		Marking and Andread		Stop Free 2.402000000 GH2
-35.5					-				+			IHOLM.	CF Step 1.000000 MHz Auto Man	Center 2.40200000 Res BW 1.0 MHz	0 GHz #VBW	1.0 MHz	Sweep 1	Span 0 Hz 0.00 ms (1001 pts)	CF Step 1.000000 MHs Auto Mar
-52.5	W	W.	74	*	W	W	*	-	84	1	мų	~ *	Freq Offset a Hz	1 N 1 t 2 N 1 t 3 N 1 t 4	2.867 ms 3.726 ms 6.613 ms	4.23 dBm 3.04 dBm 4.60 dBm			Freq Offset a Ha
Center	2.40	200000	GHz	t								Span 0 Hz		6 7 8 9 10 11					

CH39 Time Interval between hops

CH 39Transmission Time

BR Nøysiget Spectrum Gealume - Sorapt Sk		BF Kaysigen Spectrum Gnalyter - Swept Sh	- 2 -
mil nr sense.mm Auten acro 64/62/32 mm sep 26.3 Center Freq 2.441000000 GHz Trig: Video Avg Type: Log-Pwr Trig: Video	5 6 Frequency	M H	Frequency
In California Do del Della Contracto del Della	Auto Tune	Ref Offset 05 dB Mkr3 6.613 ms 10 dBk/av 415m 20.50 dB	Auto Tune
	Center Freq 2.441000000 GHz		Center Freq 441000000 GHz
	Start Freq 2.441000000 GHz	4.05 4.05 2.05 305 2.05 2	Start Freq 441000000 GHz
105	Stop Freq 2.441000000 GHz	45 WWWMA WSMAA 22	Stop Freq 441000000 GHz
.85	CF Step 1.000000 MHz Auto Man	Center 2.44 1000000 GHz Span 0 Hz Res BW 1.0 MHz #VBW 1.0 MHz Sweep 10.00 ms (1001 pts)	CF Step 1.000000 MHz to Man
	Freq Offset	N L 2.867 ms 4.17 dBm Doctory Doctory <thdoctory< th=""> Doctory<!--</td--><td>Freq Offset 0 Hz</td></thdoctory<>	Freq Offset 0 Hz
485 Center 2.441000000 GHz Span 0	Hz	9 9 10 11	
NES DW 1.0 MHZ SWEED 50.00 ms (1001 p NSO status	(5)	MSG UTATUS	



CH 78 Time Interval between hops

CH 78 Transmission Time

🛃 Keyaiget Spectrum Andyzer - Sweer SA		Line 🕼 Kayangen Sporthrum Analyzar - Swept SA
Center Freq 2.480000000 GHz Trig Mileo Aug Type: Log-Pwr Tracs	2 3 4 5 6 Frequency	Center Freq 2.480000000 GHz Tric Video Avg Type: Log Pwr TRUCE 12.3 45 6 Frequer
IFGain:Low Atten: 30 dB DETIP	Auto Tupe	IFGainLow Atten: 30 dB Durt mininin
Ref Offset 0.5 dB 10 dB/div Ref 20.50 dBm		Ref Offset 0.5 dB Mkr3 6.613 ms 3.63 dBm 3.63 dBm
85	Center Free 2.490000000 GH	1 00 1 1 2 1 1 1 2 1 1 1 1 2 1 1 1 1 1 1
	Start Free 2.48000000 GH:	C 192 192 192 192 193 193 193 194 195 194
.135	Stop Fred 2.49000000 GH	455
305	CF Step 1.000000 MH:	pp Center 2.480000000 GHz Span 0 Hz Ci Ha Res BW 1.0 MHz ≢VBW 1.0 MHz Sweep 10.00 ms (1001 pts)
185 m w w w w w		1 N 1 t 2 857 ms 3 32 dBm
-85	Freq Offse	ef 2 N 1 t 3.726 ma 2.09 dBm Freq
@ 5		
Center 2.480000000 GHz Spa Res BW 1.0 MHz #VBW 1.0 MHz Sweep 50.00 ms (10/	n 0 Hz D1 pts)	
M60 STATUE	and the second se	MISC

Note:

The dwell times of the packet type of DH1, DH3, and DH5 are tested. Only the worst case is shown on the report.



10. Occupied Bandwidth

10.1. Test Setup



10.2. Limits

N/A

10.3. Test Procedure

The EUT was setup to ANSI C63.4, 2014; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

10.4. Uncertainty

± 283Hz



10.5. Test Result of Occupied Bandwidth

Product	:	Portable Printer
Test Item	:	Occupied Bandwidth Data
Test Site	:	No.3 OATS
Test date	:	2018/09/25
Test Mode	:	Mode 1: Transmit - 1Mbps (GFSK)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
00	2402	993		NA
39	2441	996		NA
78	2480	996		NA

Figure Channel 00:

🊺 Keysig	ht Spectrum	n Analyzer - Sw	ept SA								
Cente	r Freq	^F 50 Ω 2.40200	AC 00000 GH	lz	SEN	Run	Avg Type	ALIGN AUTO : Log-Pwr	03:33:38 PI TRAC	4 Sep 25, 2018 E 1 2 3 4 5 6 E M WWWWW	Frequency
10 dB/c	Re liv R e	ef Offset 0.4	5 dB	iO: Wide ⊆ Gain:Low	#Atten: 2	0 dB		Mkr2	2.401 5 -14.	02 GHz 90 dBm	Auto Tune
Log				* ²	~~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~ ³			-14.83 dBm	Center Freq 2.402000000 GHz
-29.5 — -39.5 — -49.5 ;**	~~~~~~~/	~~~~							- M		Start Freq 2.400500000 GHz
-59.5 — -69.5 — -79.5 —											Stop Freq 2.403500000 GHz
Cente #Res I	r 2.402 BW 30	000 GHz kHz		#VBV	/ 100 kHz		Sweep	(#Swp) 3	Span 3 .200 ms (.000 MHz 1001 pts)	CF Step 300.000 kHz Auto Man
MXX MOI 1 N 2 N 3 N 4 5 6 7 8 9 10 11	DE TRC SC 1 f 1 f 1 f 1 f 		x 2.402 164 2.401 50 2.402 494	5 GHz 2 GHz 5 GHz	5.17 df -14.90 df -14.95 df	FUNC Bm 3m 3m 3m		NCTION WIDTH	FUNCTION	DN VALUE	Freq Offset 0 Hz
	_				III			0747		E E	
MaG								STATUS			

🎉 Keysight Sp	ectrum Analyzer - Sw	rept SA						
Center F	RF 50 Ω Freq 2.44100	AC 00000 GHz	SENS	E:INT Avg Ty Run	ALIGN AUTO	03:39:18 PM TRAC	4 Sep 25, 2018 E 1 2 3 4 5 6 E M WWWWW	Frequency
10 dB/div	Ref Offset 0. Ref 10.50	FRO: WI IFGain:Li 5 dB dBm	w #Atten: 20	dB	Mkr2	2.440 5 -15.0	05 GHz 04 dBm	Auto Tune
-9.50		•	2	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	3		-14.87 dBm	Center Freq 2.441000000 GHz
-29.5	el.						Lange on the	Start Freq 2.439500000 GHz
-59.5 -69.5 -79.5								Stop Freq 2.442500000 GHz
Center 2. #Res BW	441000 GHz 30 kHz	#	VBW 100 kHz	Swee	p (#Swp) 3	Span 3 .200 ms (.000 MHz 1001 pts)	CF Step 300.000 kHz <u>Auto</u> Man
Alexa Model Model <th< th=""><td>I f 1 f 1 f</td><td>2.441 168 GHz 2.440 505 GHz 2.441 501 GHz</td><td>z 5.13 dBr z -15.04 dBr z -14.96 dBr</td><td></td><td>FUNCTION WIDTH</td><td></td><td></td><td>Freq Offset 0 Hz</td></th<>	I f 1 f 1 f	2.441 168 GHz 2.440 505 GHz 2.441 501 GHz	z 5.13 dBr z -15.04 dBr z -14.96 dBr		FUNCTION WIDTH			Freq Offset 0 Hz
11 < MSG			m		STATU	5	•	

Figure Channel 39:

Figure Channel 78:





PSK)
)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
00	2402	1344		NA
39	2441	1347		NA
78	2480	1341		NA

Figure Channel 00:

🎉 Keysight S	pectrum	Analyzer - Sw	ept SA								
Center	-req	50 Ω 2.40200	AC 0000 GH	Ηz	SEN	ISE:INT	Avg Ty	ALIGN AUTO pe: Log-Pwr	08:03:37 P	MOct 12, 2018 CE 1 2 3 4 5 6	Frequency
10 dB/div	Rei Re	f Offset 0.9	P IF 5 dB d Bm	NO:Wide G Gain:Low	#Atten: 2	0 dB		Mkr2	2.401 3 -18.	37 GHz 17 dBm	Auto Tune
-19.50			X	2)1 	~~~~	3		-18.04 dBm	Center Freq 2.402000000 GHz
-29.5 -39.5 -49.5	~~~~	~^~								~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	Start Freq 2.400500000 GHz
-59.5 -69.5 -79.5											Stop Freq 2.403500000 GHz
Center 2 #Res BV	.4020 V 30 k	00 GHz Hz		#VB\	N 100 kHz		Sweep) (#Swp) 3	Span 3 3.200 ms (.000 MHz (1001 pts)	CF Step 300.000 kHz <u>Auto</u> Man
Mike Mode 1 N 2 N 3 N 4 5 6 7 8 9 10 11 <			x 2.402 00 2.401 33 2.402 68	6 GHz 7 GHz 1 GHz	1.96 dB -18.17 dE -18.05 dE	3m 3m 3m 					Freq Offset 0 Hz
MSG								STATU	s		



🎉 Keysight S	pectrum Analyzer - Sw	ept SA									
<mark>⊯ RL</mark> Center F	RF 50 Ω Freq 2.44100	AC 00000 GH	z	SEN	SE:INT	Avg Type	ALIGN AUTO E: Log-Pwr	08:08:12 P	M Oct 12, 2018	Frequency	
10 dB(div	PNO: Wide - #Atten: 20 dB Ref Offset 0.5 dB 0 dB/div Ref 10.50 dB -18.41 dBm										
-9.50		↓ ²		\sim)1 \		3		-17.95 dBm	Center Freq 2.441000000 GHz	
-29.5 -39.5 -49.5								-	www	Start Freq 2.439500000 GHz	
-59.5 -69.5 -79.5										Stop Freq 2.442500000 GHz	
Center 2 #Res BW	2.441000 GHz V 30 kHz	×	#VBW	/ 100 kHz	ELIM	Sweep ((#Swp) 3	Span 3 .200 ms (.000 MHz 1001 pts)	CF Step 300.000 kHz <u>Auto</u> Man	
1 N 2 N 3 N 4 5 6 7 8 9 10 11		2.441 009 2.440 340 2.441 687) GHz) GHz 7 GHz	2.05 dB -18.41 dB -18.01 dB	m m m					Freq Offset 0 Hz	
MSG				III	-		STATUS	5			

Figure Channel 39:

Figure Channel 78:





Product	:	Portable Printer
Test Item	:	Occupied Bandwidth Data
Test Site	:	No.3 OATS
Test date	:	2018/09/25
Test Mode	:	Mode 2: Transmit - 3Mbps (8DPSK)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
00	2402	1320		NA
39	2441	1317		NA
78	2480	1320		NA

📕 Keysight Spectrum Analyzer - Swept SA đ ALIGN AUTO Avg Type: Log-Pwr 03:58:44 PM Sep 25, 2018 TRACE 1 2 3 4 5 6 TYPE M WWW DET P N N N N N Center Freq 2.40200000 GHz PNO: Wide C IFGain:Low SENSE:INT Frequency Trig: Free Run #Atten: 20 dB Auto Tune Mkr2 2.401 355 GHz -18.32 dBm Ref Offset 0.5 dB Ref 10.50 dBm 10 dB/div Log ()1 .500 **Center Freq** 2.402000000 GHz 9.50 **∮**² ~3 -17.92 dB 19.5 29.5 Start Freq 39.5 2.400500000 GHz \sim \sim 49 F -59.5 Stop Freq 69.5 2.403500000 GHz 79.5 Center 2.402000 GHz #Res BW 30 kHz Span 3.000 MHz Sweep (#Swp) 3.200 ms (1001 pts) CF Step 300.000 kHz Man #VBW 100 kHz Auto MKR MODE TRC SCL FUNCTION FUNCTION WIDTH FUNCTION VALUE 1 N 1 f 2 N 1 f 3 N 1 f 4 2.402 168 GHz 2.401 355 GHz 2.402 675 GHz 2.08 dBm -18.32 dBm -18.17 dBm Freq Offset 0 Hz 10 11 Ш STATUS SG

Figure Channel 00:



🍺 Keysight Sp	ectrum Analyzer - Sw	ept SA								
Center F	RF 50 Ω Freq 2.44100	AC 00000 GHz	:	SEN	ISE:INT	Avg Type	ALIGN AUTO E: Log-Pwr	04:04:18 PI TRAC	M Sep 25, 2018	Frequency
	PNO: Wide THE Free Kun IFGain:Low #Atten: 20 dB Mkr2 2.440 361 GHZ Ref Offset 0.5 dB Mkr2 2.440 361 GHZ									
10 dB/div Log -9.50 -19.5	Ref 10.50 (dBm ↓ 2	~~~~	~~~~		m	√ ³	-18.	-17.93 dBm	Center Freq 2.441000000 GHz
-29.5 -39.5 -49.5								-	\sim	Start Freq 2.439500000 GHz
-59.5 -69.5 -79.5										Stop Freq 2.442500000 GHz
Center 2. #Res BW	441000 GHz 30 kHz	X	#VBW	100 kHz	FUN	Sweep ((#Swp) 3	Span 3 .200 ms (.000 MHz 1001 pts) DN VALUE	CF Step 300.000 kHz <u>Auto</u> Man
1 N 2 N 3 N 4 5 6 7 8 9 10 11 <		2.441 171 (2.440 361 (2.441 678 (GHz GHz GHz	2.07 dE -18.00 dE -17.98 dE	3m 3m 3m 					Freq Offset 0 Hz
MSG							STATUS	\$		

Figure Channel 39:

Figure Channel 78:





11. EMI Reduction Method During Compliance Testing

No modification was made during testing.